

JPRS 68816

23 March 1977

USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS  
CHEMISTRY  
No. 53

20000309 108

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

**DISTRIBUTION STATEMENT A**  
Approved for Public Release  
Distribution Unlimited

Reproduced From  
Best Available Copy

U S S R

EAST  
EUROPE

#### NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [ ] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

#### PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22151. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS 68816

23 March 1977

USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

CHEMISTRY

No. 53

<b>BIBLIOGRAPHIC DATA SHEET</b>	1. Report No.	JPRS 68816	2.	3. Recipient's Accession No.														
	4. Title and Subtitle			5. Report Date														
USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS - CHEMISTRY No. 53			23 March 1977															
7. Author(s)			6.															
9. Performing Organization Name and Address			8. Performing Organization Rept. No.															
Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201			10. Project/Task/Work Unit No.															
12. Sponsoring Organization Name and Address			11. Contract/Grant No.															
			13. Type of Report & Period Covered															
			14.															
15. Supplementary Notes																		
16. Abstracts																		
<p>The report contains abstracts and news items on adsorption phenomena, aerosols, alkaloids, analytica, electro- and biochemistry, coal gasification, combustion and explosives, environmental pollution, food technology, free radicals, ion exchange, organometallic and organophosphorus compounds, pesticides, industrial toxicology, petroleum processing technology, radiation chemistry, and related fields.</p>																		
17. Key Words and Document Analysis. 17a. Descriptors																		
<table border="0"> <tr> <td>USSR</td> <td>Chemical Engineering</td> </tr> <tr> <td>Eastern Europe</td> <td>Biochemistry</td> </tr> <tr> <td>Chemical Analysis</td> <td>Agricultural Chemistry</td> </tr> <tr> <td>Organic Chemistry</td> <td>Pharmacology</td> </tr> <tr> <td>Physical Chemistry</td> <td>Petrochemistry</td> </tr> <tr> <td>Inorganic Chemistry</td> <td>Radiation Chemistry</td> </tr> <tr> <td></td> <td>Toxicology</td> </tr> </table>					USSR	Chemical Engineering	Eastern Europe	Biochemistry	Chemical Analysis	Agricultural Chemistry	Organic Chemistry	Pharmacology	Physical Chemistry	Petrochemistry	Inorganic Chemistry	Radiation Chemistry		Toxicology
USSR	Chemical Engineering																	
Eastern Europe	Biochemistry																	
Chemical Analysis	Agricultural Chemistry																	
Organic Chemistry	Pharmacology																	
Physical Chemistry	Petrochemistry																	
Inorganic Chemistry	Radiation Chemistry																	
	Toxicology																	
17b. Identifiers/Open-Ended Terms:																		
17c. COSATI Field/Group 7A, 7B, 7C, 7D, 7E, 6A, 6F, 60, 19A																		
18. Availability Statement		19. Security Class (This Report)	21. No. of Pages															
		UNCLASSIFIED	76															
		20. Security Class (This Page)	22. Price															
		UNCLASSIFIED	A065															

23 March 1977

## USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

## CHEMISTRY

No. 53

This serial publication contains abstracts of articles and news items from USSR and Eastern Europe scientific and technical journals on the specific subjects reflected in the table of contents.

Photoreproductions of foreign-language sources may be obtained from the Photoduplication Service, Library of Congress, Washington, D. C. 20540. Requests should provide adequate identification both as to the source and the individual article(s) desired.

CONTENTS	PAGE
Agrochemistry .....	1
Biochemistry .....	2
Environmental Pollution .....	6
Fertilizers .....	19
Nitrogen Compounds .....	23
Organometallic Compounds .....	27
Organophosphorus Compounds .....	29
Pesticides .....	34
Pharmacology and Toxicology .....	54
Radiation Chemistry .....	63
Water Treatment .....	66
East Europe .....	70

USSR

UDC 633.11:631.81

RELATIONSHIP BETWEEN THE CONTENT OF TOTAL NITROGEN, PROTEIN AND GLUTEN IN WINTER WHEAT GRAIN

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 14, No 6, 1976 pp 49-52

TOLSTOUSOV, V. P., Agriculture Ministry USSR

[Abstract] Statistical analysis was carried out on more than 3000 indicators from 310 field experiments on various grades of winter wheat, using a regression analysis program PRA-3 and the computer MINSK-32. A correlation was found for total nitrogen content and protein concentration which was practically independent of the soil and climatic conditions, plant predecessors and nitrogen fertilization levels. On this basis an equation was derived for calculation of the protein content in winter wheat grain from the amount of total nitrogen. Another analysis was performed for the relationship between gluten and protein showing that the amount of raw gluten in grain could be determined from its protein content. Tables 4; references 11: all Russian.

USSR

UDC 632.954.028:633.2

RESIDUES OF 2,4-D AMINE SALT IN PASTURE FEED

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 36-38

ANDRALOV, V. A., and MOSTOVOY, M. I., Siberian Scientific Research Institute of the Introduction of Chemistry into Agriculture

[Abstract] It has been shown that feed from pasture lands treated with 1.2 kg/hectare doses of 2,4-D under conditions of insufficient water supply applied over meadowy-chernozem soil in Novosibirsk Oblast' may be used for feeding purposes only after 40 days past the last treatment with the herbicide. Under conditions of adequate heat and water supply coupled with high levels of fertilization, the residual 2,4-D may be degraded at a faster rate. Under the influence of 2,4-D the weed content drops significantly, improving the quality of the harvest. Tables 4; references 10: 9 Russian, 1 Western.

USSR

UDC 547.96:577.156+541.69

EFFECT OF PROTEOLYTIC ENZYMES ON THE PURPLE MEMBRANES OF HALOBACTERIUM HALOBIUM

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 2, No 8, Aug 76 pp 1148-1150  
manuscript received 14 Jun 76

ABDULAYEV, N. G., KISELEV, A. V., and OVCHINNIKOV, YU. A., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, Academy of Sciences USSR, Moscow

[Abstract] The main function of bacteriorhodopsin in a bacterium cell is to provide light-dependent proton transport resulting in the appearance of an electrochemical potential difference of the hydrogen ions across the membrane. This paper reports on the investigation of the accessibility of bacteriorhodopsin to papain in a native purple membrane. Practically all molecules of bacteriorhodopsin have been found to undergo limited proteolysis. After treatment with papain bacteriorhodopsin was capable of participating in the photochemical cycle and of producing the electrochemical potential difference across a flat synthetic membrane, in spite of the fact that papain splits off about a third of the protein material. Papain's action is directed both at the N- and C-terminal portions of the molecule. At this moment it is a puzzle why the protein molecules in the membranes undergo two different types of limited proteolysis under the action of papain. References 6: 2 Russian, 4 Western.

USSR

UDC 577.158.42

EFFECT OF C-4'-MODIFICATION OF THIAMINE PYROPHOSPHATE ON ITS COENZYME ACTIVITY IN THE REACTION OF OXIDATIVE DECARBOXYLATION OF PYRUVIC ACID

Kiev UKRAYINS'KIY BIOKHMICHNYY ZHURNAL in Russian Vol 48, No 4, Jul/Aug 76  
pp 503-509 manuscript received 20 Nov 76

SEVERIN, S. YE., KHAYLOVA, L. S., and BERNKHART, R., Chair of Biochemistry, Moscow University imeni M. V. Lomonosov

[Abstract] The reaction of pyruvate dehydrogenase (EC 1.2.4.1) with C-4'-substituted analogues of thiaminepyrophosphate, 4'-N(CH<sub>3</sub>)-TPP, 4'-N(CH<sub>3</sub>)<sub>2</sub>-TPP and OH-TPP was studied. None of them were found to replace TPP in determining the enzyme activity by reduction of NAD or 2,6-dichlorophenylindophenol (2,6-DCPI) nor by decarboxylation of the pyruvate. The decarboxylase activity of pyruvate dehydrogenase (PDH) component was determined by isolated <sup>14</sup>CO<sub>2</sub> or by the formation of 1-<sup>14</sup>C-pyruvate and 2-<sup>14</sup>C-pyruvate. All analogues were found to be competitive inhibitors of PDH; the k<sub>i</sub> of 4'-N(CH<sub>3</sub>)-TPP, 4'-N(CH<sub>3</sub>)<sub>2</sub>-TPP and 4'-OH-TPP was respectively

$4.1 \times 10^{-5}$ ,  $8.5 \times 10^{-5}$  and  $2.9 \times 10^{-6}$  M;  $K_M$ TPP is  $1-2 \times 10^{-7}$  M. An assumption has been made that analogues of the holoenzymic complex forming PDH complexes with mono-, dimethyl-TPP and OH-TPP do not bind the substrate to 2-C-thiazole ring of the coenzyme. Figures 4; table 1; references 16: 2 Russian, 14 Western.

USSR

UDC 577.158.42

ROLE OF HISTIDINE RESIDUES OF MUSCLE PYRUVATE DEHYDROGENASE IN THIAMINE  
PYROPHOSPHATE BINDING

Kiev UKRAYINS'KIY BIOKHIMICHNYY ZHURNAL in Russian Vol 48, No 4, Jul/Aug 76  
pp 510-516 manuscript received 20 Nov 75

SEVERIN, S. YE., KHAYLOVA, L. S., and KEREYEVA, D. N., Chair of Biochemistry,  
Moscow University imeni M. V. Lomonosov

[Abstract] In the reaction of diethylpyrocarbonate (DEP) with pyruvate dehydrogenase component (PDH) one observes a modification of 3-5 histidine residues per mole of enzyme, accompanied by decreased enzyme activity. The level of activity relates to the content of chloroenzyme complex in PDH. If the inhibition of DEP occurs in presence of dithiotreitol, almost total (94%) reactivation of PDH is observed in presence of neutral hydroxylamine. In absence of SH-groups protection, incomplete reactivation of hydroxylamine is observed (79%). Titration with 5,5-di-thio-bis-(2-nitrobenzoic acid) in 8M urea showed that the DEP modified protein contains fewer SH groups than the native enzyme. An assumption was made that the DEP modified SH groups are not essential for enzyme activity. TPP in combination with  $Mg^{2+}$  ( $10^{-3}$  M) protects PDH from being inactivated by DEP, TPP ( $10^{-2}$  M) reactivates PDH by 70% after its complete inhibition by DEP. Similar protective action is manifested by ATP, ADP and inorganic pyrophosphate in the presence of  $Mg^{2+}$ . A kinetic study showed a competitive type inhibition of PDH by DEP with respect to TPP. It has been concluded that the histidine residues of PDH are involved in TPP binding. Figures 4; table 1; references 19: 7 Russian, 12 Western.



USSR

UDC 615.2/.3:608.3

SOME PROBLEMS IN COMPOSING A DESCRIPTION OF AN INVENTION OF A BIOLOGICALLY ACTIVE COMPOUND

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 10, Oct 76 pp 45-49 manuscript received 12 Jun 74

CHERVOVA, L. V., MASHKOVA, I. V., and AVIDON, V. V., Scientific Research Institute on Biological Tests of Chemical Compounds, Kupavna, Moskovskaya Oblast

[Abstract] Recommendations are made on compiling a description of a new biologically active compound in applying for a patent. The article is broken down into the particulars of the necessary components of the description: the title of the invention, region of application, characterization of analogs of the invention, characterization of prototypes, objections to the prototypes, purpose of the invention, essence of the invention, examples of specific realizations of the invention, technical and economic effectiveness and formula. References 6 Russian.

USSR

COMPARATIVE STUDY OF THE DYNAMIC STRUCTURE OF ACTIVE CENTERS OF PROTEOLYTIC ENZYMES BY THE ULTRASONIC METHOD. INFLUENCE OF ULTRASOUND ON  $\alpha$ -TRIPSIN,  $\beta$ -TRIPSIN AND TRIPSINOGEN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 2 No 6 Jun 76 pp 828-835 manuscript received 24 December 75

KLIBANOV, A. M., KAZANSKAYA, N. F., LARIONOVA, N. I., MARTINEK, K. and BEREZIN, I. V., Chemical Department and Interdepartmental Laboratory of Bioorganic Chemistry, Moscow State University

[Abstract] It is shown that when cavitation ultrasound acts on dilute solutions of  $\alpha$ - and  $\beta$ -tripsins, irreversible inactivation of the enzymes occurs, the rate of which follows first order kinetics. This allows the ultrasonic method of study of the dynamic structure of active centers of enzymes to be used for quantitative investigation of pH and temperature-induced information changes in the active centers of both forms of tripsin. The curve of the ultrasonic inactivation rate constants as a function of pH for  $\alpha$ - and  $\beta$ -tripsins has an inverted bell shape. This result is interpreted within the framework of the existence of 3 conformation states of active tripsin centers, the transitions between which are checked by ionogenic groups with K 1.9-2.0 and 9.1. The study of the temperature dependence for  $K_{inact}$  shows that at 41 C in the case of  $\alpha$ -tripsin and 35 C in the case of  $\beta$ -tripsin, reversible conformational changes occur in the

active centers, characterized by values of  $\Delta h$  and  $\Delta s$  of 79 kcal/mol, 250 eu and 35 kcal/mol, 113 eu respectively. Based on the data produced by the ultrasonic method, the dynamic structures of the active centers of  $\alpha$ - and  $\beta$ -trypsins, as well as trypsin and chemotrypsin, are compared. 21 references.

USSR

UDC 577.156.3.031

A COMPARATIVE STUDY OF THE DYNAMIC STRUCTURE OF THE ACTIVE CENTERS OF PROTEOLYTIC ENZYMES BY THE ULTRASOUND METHOD. EFFECT OF ULTRASOUND ON  $\alpha$ -TRYPSIN,  $\beta$ -TRYPSIN AND TRYPSINOGEN

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 2, No 6, Jun 76 pp 828-836

KLIBANOV, A. M., KAZANOVSKAYA, N. F., LARIONOVA, N. I., MARTINEK, K., and BEREZIN, I. V., Chemistry Faculty and Interfaculty Laboratory of the Bioorganic Chemistry, Moscow State University imeni M. V. Lomonosov

[Abstract] An irreversible inactivation takes place when dilute solutions of  $\alpha$ - and  $\beta$ -trypsin are exposed to the action of cavitationultrasound. This inactivation appears to be a first order reaction. This made it possible to use the ultrasound method for investigation of the dynamic structure of the active centers of these enzymes by a quantitative study of induced pH and temperature induced conformational changes. The rate constant of ultrasound inactivation of  $\alpha$ - and  $\beta$ -trypsine expressed as a function of pH has a bell shape, leading to the interpretation in terms of the existence of three conformational states of the active centers, transition between which is controlled by inorganic groups with pK 1.9, 2.0 and 9.1. The temperature dependence of the rate constant of ultrasound inactivation showed that a reversible conformation transition occurs for  $\alpha$ -trypsin at 41° and  $\beta$ -trypsin at 35°, with  $\Delta H$  of 79 kcal/mole and 35 kcal/mole and  $\Delta S$  of 250 e.v. and 113 e.v. respectively. Figures 4; tables 2; references 21: 4 Russian, 17 Western.

USSR

UDC 628.543.1[471.66]

SEWAGE DECONTAMINATION AT ENTERPRISES OF THE "GROZNEFTEORGSIINTEZ" UNION

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 5-7

MUSAYEV, D. D., and SLYADNEV, YE. F., Groznetekhimzavody

[Abstract] Sewage decontamination procedures at enterprises of the "Groznefteorgsintez" Union, and the measures undertaken for protection of the Sunzhi river against pollution are described. The sewage decontamination activities are directed at decreasing both the quantity of sewage and the quantity of pollutants therein. The conclusion is drawn that single-stage biochemical purification of the runoff from the first collector system is necessary prior to its recycle to the water-supply system. Tables 2; figures 1.

USSR

UDC 628.543.94

EXPERIENCE IN WORK ON THE PROTECTION OF RESERVOIRS AND THE ATMOSPHERE FROM POLLUTANTS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 7-8

GRIGOR'YEVA, K. N., and BAYNZAROVA, T. T., Salavatskiy Petrochemical Complex

[Abstract] Activities of the Salavatskiy Petrochemical Complex are specified with respect to the decrease of pollutants in sewage dumped into the Belaya river and the decrease of discharges into the atmosphere. Included among the benefits are a decrease of petroleum and petroleum-product losses, as well as water-supply and atmospheric-quality improvement.

USSR

UDC 628.3:577.15.041

STUDY OF THE KINETICS OF BIOCHEMICAL PETROLEUM-PROCESSING PLANT SEWAGE OXIDATION

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 8-12

GERBER, V. YA., SHARAFUTDINOV, V. M., and GERCHIKOV, A. YA., Bashkir Scientific Research Institute of the Petroleum Industry, Bashkir State University

[Abstract] A study was made of oxygen consumption during the biochemical oxidation of petroleum-processing plant sewage. The procedure of conducting

kinetic plant sewage under various conditions is described. Results of experimental data are presented on the influence of the dehydrogenation activity of sludge, the concentrations of active sludge, dissolved oxygen, and pollutants upon the rate of oxygen consumption. A kinetic model is proposed, which may be used for describing the biochemical oxidation of petroleum-processing plant sewage. Figures 4; references 8 Russian.

USSR

UDC 628.543.5

THE EMPLOYMENT OF TECHNICAL OXYGEN FOR THE BIOLOGICAL PURIFICATION OF  
PETROLEUM-PROCESSING PLANT SEWAGE

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 12-16

GERBER, V. YA., GUBANOVA, G. D., and IOAKIMIS, E. G., Bashkir Scientific Research Institute of the Petroleum Industry

[Abstract] To check the possibilities of using pure oxygen or oxygen-enriched air for intensifying the process of the biochemical purification of petroleum-processing plant sewage, there are presented results of parallel experiments on the biological purification of petroleum-processing plant sewage during aeration by air and technical oxygen. It is shown a considerable intensification of the process of biochemical sewage purification with the employment of technical oxygen instead of air is possible. Tables 3; references 8: 4 Russian, 4 Western.

USSR

UDC 628.543.5(571.53)

EXPERIENCE IN THE OPERATION OF THE BIOLOGICAL PURIFICATION STRUCTURES OF THE  
ANGARA PETROCHEMICAL COMPLEX

Moscow KHIMIYA I TEKHNLOGIYA TOPLEV I MASEL in Russian No 11, 1976 pp 16-17

YELKIN, V. M., SKRIPKIN, O. N., FALEYEVA, O. I., and IMANOV, E. G., Angara Petrochemical Complex

[Abstract] An account is given of the operation of the biological purification structures of the Angara Petrochemical Complex, the first section having gone into operation in 1964, and the second -- in 1973. Technological indices of the operation of the aerotanks are presented, together with characteristics of the sewage. Results of laboratory testing of the effect of surface-active

substances and solvar upon the process of biological purification are shown, and the permissible concentration of surface-active substances (10 mg/liter) and solvar (up to 5 mg/liter) in the sewage is established. Tables 2.

USSR

UDC 628.543.2:547.461.4

PURIFICATION OF THE SEWAGE OF AN INSTALLATION FOR THE PRODUCTION OF SUCCINAMIDE ADDITIVES AT THE PERM' PETROLEUM PROCESSING PLANT

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 18-19

VASILENKO, G. D., TIKHONRUK, I. F., SIN'KOVSKAYA, Z. A., and PTOMOV, A. S., VNIIPKneftekhim

[Abstract] In determining the conditions of the production of sewage containing such synthesis components as diethylene triamine (DETA), maleic anhydride, and xylene, and the possibility of its purification with the common plant sewage in biochemical purification installations, laboratory research was conducted on a study of the toxicity of DETA during its arrival at the biochemical purification structures of the Perm' Petroleum Processing Plant in concentrations of 5-25 mg/liter. It was established that in accordance with adaptation of the microflora to the active sludge, the permissible concentration of DETA may be increased from 5 to 10 mg/liter. Tables 1; figures 4; references 2 Russian.

USSR

UDC 628.543:1:546.214

USE OF OZONE FOR THE PURIFICATION AND SUPPLEMENTARY PURIFICATION OF PETROLEUM-PROCESSING PLANT SEWAGE

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 20-23

SHARIFOV, R. R., Baku branch, All-Union Scientific Research Institute of Water Supply, Sewer Systems, Hydraulic Engineering Structures, and Engineering Hydrogeology

[Abstract] In studying measures for the adequate removal of petroleum and petroleum products from the industrial sewage of petroleum-processing plants, consideration is given to the possibility of the use of ozone for the supplementary purification of petroleum-processing plant sewage after biological purification. A study is made of the efficiency of conducting the process, and an optimum ozonification regime is derived. A study is made of changes taking place in the composition of the organic portion, during the ozonification of petroleum-processing plant sewage. Tables 4; references 6 Russian.

USSR

UDC 665.65:628.543.2

#### PURIFICATION OF PETROCHEMICAL-INDUSTRY SEWAGE

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 23-26

NEMCHENKO, A. G., SAMOYLOVA, L. M., MAMONTOVA, O. V., RUBINSKAYA, E. V., and VAYNER, V. L., All-Union Scientific Research Institute of Petrochemical Processes

[Abstract] In search of an improvement over the conventional biochemical method of petrochemical-industry sewage purification, a desorption-adsorption method of extracting aromatic hydrocarbons from industrial sewage is presented. For removing toxic nitrogen-, chlorine-, and sulfur-containing organic substances from sewage, a method of ozonification with subsequent supplementary biological purification is proposed. For purifying sewage containing mineral salts, a method is proposed for reverse osmosis with the use of filtering membranes of the "Vladipor" type. It is shown that use of the reverse osmosis method is economically more expedient than use of the existing ion-exchange method. Table 1; figures 4; references: 4 Russian.

USSR

UDC 665.622

#### DECONTAMINATION OF PETROLEUM SLIMES

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 35-38

BIBIKOV, G. G., NEMCHENKO, A. G., GALUTKINA, K. A., APOSTOLOVA, I. V., and KARAZEYEVA, L. P., All-Union Scientific Research Institute of Petrochemical Processes

[Abstract] In a discussion of the decontamination of petroleum slurries, which comprise as much as 1% of the petroleum processed at petroleum-processing plants and petrochemical complexes, results are presented of an investigation of petroleum slurries selected from petroleum traps of sewerage systems I and II, the return-water petroleum separation systems, the separation reservoirs, and the products and raw-material base of the Kirishskiy petroleum-refinery and the Salavatskiy petrochemical complex. There are presented the specifications of a drum furnace for the thermal decontamination of petroleum slurries, and the operation of the furnace is described. Tables 2; figures 2; references: 3 Russian.

USSR

UDC 665.637.8:66.074.3

CATALYTIC DECONTAMINATION OF ASPHALT-PRODUCTION EXHAUST GASES

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 38-39

NADZHAFOV, YU. B., and SMELOVA, V. YE., TB [expansion unknown] Scientific Research Institute

[Abstract] In a study of the catalytic combustion of asphalt-production exhausts to carbon dioxide, recommendations are given on the use of catalysts for deep oxidation of organic gas-air exhaust admixtures of asphalt-installation oxidizing units. The process of catalytic decontamination is conducted at a volumetric rate of 5000 liters per hour and a temperature of 350-500°C.

USSR

UDC 628.443.1:665.65

EXPERIENCE IN LOCAL PURIFICATION OF THE SEWAGE OF PETROCHEMICAL PRODUCTION FACILITIES

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 26-28

AMOSOV, V. V., ZIL'BERMAN, A. G., KUCHERYAVYKH, YE. I., SORKIN, E. I., TSARIK, L. YA., EPPEL', S. A., TIMOSHEK, V. YE., and TITOV, I. P., "Angarsknefteorgsintez", Institute of Petro- and Carbochemical Synthesis attached to the Irkutsk State University imeni Zhdanov

[Abstract] Proposals are made for sewage-purification methods which, after semi-industrial testing, are to be recommended for local purification structures. Sulfide-containing sewage is to be purified by homogeneous catalytic oxidation, while the sewage of a polystyrene production facility is to be purified by the method of foam flotation or by electrocoagulation. Tables 1; references: 6 Russian.

USSR

UDC 628.543.1:677.494.664:66.067

EXPERIENCE IN THE USE OF FOAM POLYURETHANE AS A FILTERING MATERIAL DURING THE PURIFICATION OF PETROLEUM-CONTAINING SEWAGE

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 28-30

OBZORNYI, V. F., PICHAKHCHI, I. D., and SHIMKOVICH, V. V., VNIIVO [All-Union Scientific Research Institute on Water Protection]

[Abstract] In attempts to develop new filtering materials to replace quartz filters and flotators, laboratory research established that the optimum filtration rate of petroleum-containing sewage through a layer of foam polyurethane charge at a filter-cycle duration of 10 to 260 hours and an initial pollutant concentration of 1000 - 125 mg is 30-35 meters per hour. The design of an experimental-industrial filter with a foam polyurethane charge is described. Tests of the filter under experimental industrial conditions at a filtration rate of up to 30 m/h demonstrated the possibility of obtaining stable-quality water with 5-25 mg/liter of petroleum products at their initial concentration of 100 to 5000 mg/liter. Figures 4; references 5: 4 Russian, 1 Western.

USSR

UDC 665.637.8:66.074.3

DECONTAMINATION OF BITUMEN-PRODUCTION EMISSIONS

Moscow KHIMIYA I TEKHOLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 39-41

FRYAZINOV, V. V., and GRUDNIKOV, I. B., Bashkir Scientific Research Institute of the Petroleum Industry

[Abstract] In a discussion of the decontamination of emissions originating in the production of bitumens via oxidation of petroleum-processing residues by atmospheric oxygen at a temperature of 240-300°C, consideration is given to the sources of harmful emissions during the production of bitumens, and recommendations are given on the prevention of contamination of the environment via elimination of the causes of sewage formation and oxidation-gas combustion, as well as an acute decrease in the amount of evaporations during the pouring of bitumens. Recommendations are given on the utilization of secondary heat resources. Tables 1; references 9: 6 Russian, 3 non-Russian.



USSR

UDC 547.584.002.637

DECONTAMINATION OF PHTHALIC ANHYDRIDE PRODUCTION EMISSIONS

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 44-45

AGAYEV, A. S., NADZHAFOV, YU. B., and KOBYLKINA, T. N., TB [expansion unknown] All-Union Scientific Research Institute

[Abstract] Phthalic anhydride is obtained industrially by the oxidation of o-xylene or naphthalene by atmospheric oxygen at a temperature of 400-450°C in the presence of a vanadium catalyst. It is pointed out that when phthalic anhydride is obtained on the basis of o-xylene and naphthalene, considerable emissions of phthalic and maleic anhydrides, naphthoquinones, and carbon dioxide into the atmosphere and into the production buildings are observed. A method is described for decontamination of the exhaust gases of such a production facility, based upon catalytic combustion of the harmful components all the way to CO<sub>2</sub> and H<sub>2</sub>O; the introduction of this method permits healthful improvement of the atmospheric environment. Tables 2; references: 3 Russian.

USSR

UDC 665.5213:66.022.311:628.53

THE ACTION EFFICIENCY OF ANTISMOKE ADDITIVES TO DIESEL FUEL

Moscow KHIMIYA I TEKHNLOGIYA TOPLIV I MASEL in Russian No 11, 1976 pp 45-47

MALYAVINSKIY, L. V., and ROSSINSKIY, V. M.

[Abstract] A procedure has been developed at the All-Union Scientific Research Institute of the Petroleum Industry, by means of which the efficiency of IKhP-706 additive, developed by the Azerbaydzhan SSR Institute of Chemistry and Additives, was compared to that of ECA-5222 and Paradine 12, additives developed by ESSO. The additives all contained barium, and were all added to Brand A diesel fuel in a concentration of 0.3% by mass. It was found that the IKhP-706 additive has a higher efficiency than those from ESSO, but when diesel engines are forced excessively, with over-enrichment of the fuel mixture, the efficiency of the antismoke additives decreases considerably. Figures 3; tables 3; references 4: 2 Russian, 2 Western.

USSR

UDC 614.72:613.155.3:(547.381+547.284.3+547.584

HYGIENIC STANDARDIZATION OF A MIXTURE OF ACROLEIN, ACETONE AND PHTHALIC ANHYDRIDE IN ATMOSPHERIC AIR

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press  
14 Jan 76 pp 6-10

UBAYDULLAYEV, R., and ABRAMOVA, N. S., Uzbek Scientific Research Institute of Sanitation, Hygiene, and Occupational Diseases, Tashkent

[Abstract] Acrolein, acetone, and phthalic anhydride mixtures are found in effluents of varnish-and-paint factories. The threshold concentrations of each of the three substances alone which will affect human cortical electric activity are 0.05; 0.44; and 0.02 mg/m<sup>3</sup> respectively. The authors have measured the reflex and resorptive action of mixtures of low quantities of these substances, their combined action on man, and maximum doses for one-time combined presence in atmospheric air. The combined, or joint, effect of the three as shown by perception of odor, and by electrical activity of the human brain is the full summary effect. The maximum permissible level in air for a single exposure to the mixture, expressed in fractions of the actual MPL for each separate action, is set at 1. The mean daily MPL is also set at 1. Table 1; references 7: all Russian.

USSR

UDC 613.32:678.7

PERMISSIBLE LEVELS OF MIGRATION OF CHEMICALS FROM PLASTICS INTO WATER

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press 26 Jan 76  
pp 88-90

SHEFTEL', V. O., candidate of medical sciences, All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers, and Plastics, Kiev

[Abstract] To provide sanitary control of the use of polymers in construction and food industries, a listing is suggested of permissible levels (DU) of release of harmful chemical substances from the polymers, and of permissible amounts of migration (DKM) of materials released from polymers into a model environment ("Instruction on sanitary-chemical examination of articles prepared from polymers and other synthetic materials designed for contact with food products"). Routine chemical analysis, rather than extensive toxicological tests, will make inspection possible for small health control laboratories. The model environment for analysis of migration is described as a water temperature of 20-22°, contact time of water and substance 24 hours, and specific surface of polymer material 1 cm<sup>2</sup>/cm<sup>3</sup>. Considerable data has been collected.

USSR

UDC 613.34:(628.315:362.11:616.9

HYGIENIC STUDY OF CENTRALIZED DISINFECTION OF SEWAGE FROM A CITY INFECTIOUS DISEASES HOSPITAL

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press  
15 Dec 75 pp 94-97

PROKOPOV, V. A., candidate of medical sciences, Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev, Kiev

[Abstract] The author has studied disinfection facilities for the Kherson City Infectious Diseases Hospital which has 400 beds. The facilities, installed in 1971 and designed for 160 m<sup>3</sup> sewage per day, included 2 grill-disintegrators, a two-section horizontal sand trap, 4 two-story digestion tanks, a brush mixer, a contact reservoir, and a chlorinator. Disinfection of the fermented sludge is accomplished with steam in a dehelminthator (sediment sterilizer). Data are presented for the years 1972-74 for periods of operation in the four seasons of the year. The coli titre of the sewage is used to calculate quantitative values for infestation of the sewage by pathogenic organisms. Reliable disinfection is achieved by mechanical purification, using 30 mg/l active chlorine, 60 min contact time, and residual chlorine no less than 2 mg/l. Tables 2; references 2 Russian.

USSR

UDC 628.54:662.741

STANDARDIZATION OF THE COMPOSITION OF WASTE WATERS AT THE COKE-CHEMICAL PLANTS

Moscow KOKS I KHIMIYA in Russian No 11, 1976 pp 36-38

PRIVALOV, V. YE., PAPKOV, G. I., and SUKHOMLINOV, B. P.

[Abstract] It is not possible to control all factors affecting the composition of individual components of plant waste waters. Average statistical composition of an effluent has been compiled which could be used for orientational purposes at most southern and central plants. It was possible to purify successfully such a typical "normalized" effluent with an active sediment. Concentration deviations of the biologically non-oxidizable components have been determined. The most important requirement for satisfactory purification of coke-chemical plant waste waters is a uniform intake and composition of the effluent and of its components. Table 1; no figures and no references.

USSR

UDC 628.54:662.749

INTENSIFICATION OF THE PROCESS OF FLOTATION SEPARATION OF FINELY EMULSIFIED OILS FROM WASTE WATERS

Moscow KOKS I KHIMIYA in Russian No 11, 1976 pp 38-40

SVIRIDOV, V. V., KOKOVKINA, T. F., VSHIVTSEV, V. G., SKRYLEV, L. D. (Ural Forestry Technology Institute), DERBYSHEVA, YE. K., KAGASOV, V. M., PIMENOV, I. V., (VUKHIN (?), AKULOV, P. V., and SAMARKINA, A. A., Chelyabin Metallurgy Plant

[Abstract] Experiments were performed to show that introduction of small quantities of cationic surfactants (1-5 ml/l) into the waste waters leads to a marked increase of the flotation activity of finely emulsified oil particles. It is possible thus to reach a 10-30 mg/l concentration of the residual oils. Figures 3; table 1; references 5: all Russian.

USSR

UDC 628.312:661.185]:628.35

BIOLOGICAL PURIFICATION OF WASTE WATER THAT CONTAINS SYNTHETIC SURFACTANTS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 10, Oct 76 pp 110-115 manuscript received 25 Mar 76

LUKINYKH, N. A., and TEREENT'YEVA, N. A., Scientific Research Institute of Community Water Supply and Water Purification, Moscow

[Abstract] An examination was made of some physical and chemical properties of dilute solutions of surfactants and related changes in the process of oxygen dissolution. The influence of anion-active surfactants was studied -- NP-3, sulfonol chloride and NP-1 -- as well as nonionogenic sintanol DL-9 and mixtures of these agents. The surface tensions of surfactant solutions on a gas-liquid interface were determined and the experimental results were used to calculate surface activity, excess of surfactant molecules on the gas-liquid interface, area per molecule in the absorption layer, the surface pressure of this layer and also the concentration of micelle formations and rate of development of surface-active properties. The results can be used to prevent possible negative effects of surfactants on the conditions of oxygen supply to microorganisms in active mud. References 2 Russian.

USSR

A CLOSED SYSTEM FOR THE PURIFICATION AND REUSE OF WASTE WATER AT METALLURGICAL PLANTS

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA No 12, 1976 pp 4-6

[Abstract] The increasing turnover of enormous volumes of technological water in Soviet industry calls for the development and introduction of processes assuring not only a reduction in volume of release and the maximum utilization of such water, but also its utilization in closed-circuit systems. Such systems, in addition, require only partial purification of waste water, whereas the conventional straight-through systems require deep purification in order to protect the environment. An example of this new approach to technological water is found in the case of the cold-rolling mill of the Verkh-Isetskiy Metallurgical Plant, which is located in a water-deficit region. The mill releases some 1,575 m<sup>3</sup>/hr of water contaminated with a number of environmentally dangerous substances which ordinarily would require a high degree of purification entailing great expense. A system for recycling partially purified waste water from the mill has been adopted with significant advantages in purification costs; the system, costing about 15 million rubles, requires the services of only 76 workers and serves as a significant link in environmental protection.

USSR

UDC 628.356.3:001.3

CONDITIONS FOR ECONOMIC EFFECTIVENESS OF USING TECHNICAL OXYGEN FOR THE PROCESS INTENSIFICATION IN BIOCHEMICAL PURIFICATION OF WASTE WATERS

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 9, 1976 pp 5-9

SIDORIN, L. P., SKIRDOV, I. V., CHERNEGA, L. G., and SHVETSOV, V. N., All Union Scientific Research Institute VODGEO

[Abstract] Calculations of technical-economical indexes are reported for the use of technical oxygen in biochemical purification of waste waters, on aeration stations of the plants producing nitrogen, synthetic fatty acids and synthetic rubber, on petroleum processing plants and on coke-chemical plants as well as on municipal water purification plants. This method is economical not only in cases where technical oxygen resources are present, but even on some large plants, where oxygen must be secured from the air separation stations. Tables 4; no figures or references.

USSR

UDC 628.356.31.458

EVALUATION OF THE TOXICITY OF INDUSTRIAL WASTE WATER COMPONENTS BASED ON THE DEHYDROGENASE ACTIVITY OF THE SEDIMENT

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 9, 1976 pp 9-12

GYUNTER, L. I., BELYAYEVA, M. A., and REBARBAR, M. M., Scientific Research Institute of Community Water Supply and Water Purification AKKh imeni K. D. Pamfilov

[Abstract] It has been shown to be possible to use the determination of the dehydrogenase activity of the sediment (DA) for evaluation of the toxic effect of individual components of industrial waste waters and their mixtures on the active sediment of the air tanks at municipal purification stations. A direct relationship was discovered between the load of toxic material on the sediment, lowering of the DA and deterioration of the purification quality. Concentration of the material lowering DA by 20% should be considered toxic. This method has been recommended for the use at laboratories of both the research and production organizations. Figures 4; table 1; references 7: 2 Russian, 5 Western.

USSR

UDC 66.074.396.22

DECONTAMINATION OF SILICON FLUORIDE GAS MIXTURE FROM THE PRODUCTION OF MINERAL FERTILIZERS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 10, 1976 pp 755-756

SENIN, V. N., ARKHIPOVA, L. N., SHRAMBAN, B. I., MAL'TSEVA, I. M., SUBBOTINA, O. P., TSYBINA, M. N., SMIRNOVA, M. V., and PAVLUKHINA, L. D.

[Abstract] Experimental results are reported on various methods of trapping fluoride gasses in production of mineral fertilizers. Comparative analysis showed that the best method for decontamination of silicon fluoride gasses is the alkaline absorption method; it can be used in production of simple and binary superphosphate. Table 1; references 5: all Russian.

USSR

UDC 66.023:628.543.341.52

A UNIT FOR THERMAL DECONTAMINATION OF WASTE WATERS CONTAINING TOXIC ORGANIC MATERIALS AND DISSOLVED SALTS

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 10, 1976 pp 742-744

DOLININ, N. P., EDEL'SON, L. YA., RYZHIK, Z. I., and NEYMAN, L. I.

[Abstract] A new construction unit is analyzed for decontamination of liquid industrial wastes containing toxic materials and dissolved salts. The decontamination is carried out by evaporating the waste waters and combustion of toxic organic materials. Water evaporated from the free surface of a thin film of effluent which moves continuously upward on a wall of the rotating evaporator constructed in form of a cut-off vertical cone equipped with a cover. The formation of the film and its movement upward on an inclined wall is due to the centrifugal force resulting from the rotation of the evaporator. Figures 2; references 2: both Russian.

USSR

UDC 628.543:[661.7:547.412.721.32]

PURIFICATION OF WASTE WATERS FROM PERCHLOROETHYLENE

Moscow KHIMICHESKAYA PROMYSHLENNOST' in Russian No 10, 1976 pp 745-746

YASIKOVA, L. N., CHINENNAYA, S. K., LAZAREV, V. I., and ZEGER, I. I.

[Abstract] Two methods for removing perchloroethylene from waste waters were checked out experimentally: azeotropic distillation and absorption on activated charcoal KAD. On the basis of the cost-benefit analysis using a 8680m<sup>3</sup> level of waste waters, the azeotropic distillation proved to be more economical, costing 0.32 Tuble per m<sup>3</sup>. Tables 3; no figures; references 4: all Russian.

## Fertilizers

USSR

UDC 631.84:631.559

### STUDY OF THE INFLUENCE OF NITROGEN FERTILIZER ON PLANTS AND SOIL IN A MULTIFACTOR EXPERIMENT. REPORT I. HARVEST OF PLANTS

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp. 3-12 manuscript received 12 Jan 76

KUDEYAROV, V. N., SOKOLOV, O. A. and BOCHKAREV, A. N., Institute of Agrochemistry and Soil Science, Academy of Sciences USSR

[Abstract] A multifactor microfield experiment on gray forest soil south of Moscow studied the effect of nitrogen fertilizer on the yield of buckwheat as a function of the joint application of phosphorus and potassium fertilizers. Regression equations are produced for the effect and interaction of the fertilizers on the yield of buckwheat. The experiment also covered the most optimal conditions for consumption of nitrogen on natural soil reserve. The experiment considered the yield of grain, straw and total plant mass above ground surface. It was shown that nitrogen fertilizer was very effective on the soil of the area studied. The increase in yield of buckwheat resulting from nitrogen fertilization did not depend on the phosphorus-potassium background. Phosphorus and potassium fertilizers used alone actually reduced the yield. 8 references.

USSR

UDC 631.811:631.445.4

### THE CIRCULATION OF NITROGEN AND ASH ELEMENTS IN FIELD CROPS ON ORDINARY CHERNOZEM

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp 13-19 manuscript received 9 Dec 75

TUKALOVA, Ye. I. and ZAPSHA, N. A., Moldavian Scientific Research Institute for Irrigated Agriculture and Vegetable Husbandry

[Abstract] Data are presented on the accumulation of total biomass and chemical composition of winter wheat, corn, sunflowers and second year lucerne grown in irrigated chernozem in southeastern Moldavia using mineral fertilizers. The formation of the biological harvest in the arid climate of the area depended primarily on the species peculiarities of the plants, as well as the use of irrigation and fertilizers. The total dry biomass of plants per year averaged 148-228 cw/ha; harvesting removed 28-197 cw/ha biomass, containing 71-363 of the total 739-1486 kg nitrogen and ash elements. In the remaining 31-130 cw/ha, each year 167-1031 kg nutrient elements returned to the soil, including 38-313 N, 4-29 P, 53-255 K, 36-227 Ca, 11-91 Mg and 13-50 S. 7 references.



USSR

UDC 631.461.2:631.445.11

# NITRIFICATION CAPABILITY OF CULTIVATED SURFACE-GLEY TUNDRA SOILS

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp 24-26 manuscript received  
23 Jan 76

STENINA, T. A. and LISTAROVA, V. A., Institute of Biology, Komi Affiliate,  
Academy of Sciences USSR

[Abstract] The nitrification capability of surface-gley loam tundra soils depends on the degree of cultivation of the soils simultaneous mechanical working and lime treatment of soils increased the nitrification capability. Comparatively well cultivated soils have nitrification capability reaching 50 mg N-NO<sub>3</sub> per kg of soil. Under the natural conditions of the tundra, the potential capability for nitrification is realized only rarely, and cultivated plants frequently experience a shortage of mineral nitrogen. This shortage is particularly great in the spring, when temperatures are low and air and soil moisture contents are high. This means that all cultivated tundra soils require nitrogen fertilization. 8 references.

USSR

UDC 631.85

# THE PROBLEM OF THE USE OF DEFLUORINATED PHOSPHATES AS FERTILIZER

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp 28-35 manuscript received  
12 Jan 76

SOKOLOV, A. V., OSTANIN, A. I., PODKOLZINA, G. V., FILIMONOV, N. A. and SHEVCHENKO, M. V., Scientific Research Institute of Fertilizers, Insecticides and Fungicides

[Abstract] Based on 400 field experiments in a geographic network, vegetation and laboratory studies, defluorinated phosphate introduced on the basis of the content of citric-soluble phosphorus as the primary fertilizer in all soil-climate zones of the country provides an increase in crop harvest equal to that of superphosphate. The possibility is demonstrated of using defluorinated phosphate in podzolic soils in the form of crumbs with particle diameters up to 1 mm. The fertilizer is equivalent to superphosphate only if the phosphorus which it contains is fully soluble in 2% citric acid. The use of crumb rather than powder forms reduces dusting, significantly reduces cost of production and application of the defluorinated phosphate to the soil. 9 references.

USSR

UDC 630:54:502.7

PLANTS, FERTILIZERS AND SOIL CONSERVATION

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 14, No 6, 1976 pp 64-67

BARANOV, P. A.

[Abstract] It has been shown that because of their bulk, crop residues and roots can have much greater effect on the physical properties of the soil than the organic matter present in manure. Mineral fertilizers can provide high crop yields by themselves when manure is not available. To secure large increases of crop yields under conditions of intensified agricultural activities, improvements are needed in the water-air conditions of the soil. This can be achieved by development of grains with powerful root systems, as exemplified by the development of three way rye-wheat-wheat grass hybrids in the USSR. Practical application of this development will assure efficient utilization of fertilizers by the plants, decrease the loss on nutrients and inhibit soil erosion. No tables or figures; references 11: 9 Russian, 2 Western.

USSR

UDC 633.11:631.81:

RESPONSE OF SHORT-STEM VARIETIES OF SPRING WHEAT TO FERTILIZER WITH IRRIGATION

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 9 1976 pp 28-30

POROT'KIN, Ye. I. and DEMIDOVA, T. A., Kuybyshev Scientific Research Institute for Agriculture

[Abstract] A test was made of short-stem varieties of spring wheat in the Kuybyshev area: 8 American and 4 Mexican varieties. Using ordinary  $N_{90}P_{90}K_{90}$  fertilizer, they produced a higher yield than a standard variety, the increase amounting to 2.2-9.2 cw/ha, with  $N_{180}P_{180}K_{90}$  fertilization -- the yield increase was 11.0-16.2 cw/ha. The American varieties world seeds 1809 and 1616 and the Mexican variety tobari 66 are recommended for extensive use. The qualities found superior in the western varieties included yield, grain quality, wind knockdown resistance and disease resistance.

INFLUENCE OF TIME OF INTERACTION OF ELEVATED DOSES OF PHOSPHORUS FERTILIZERS  
WITH CHERNOZEM ON THE NATURE OF CONVERSION AND AVAILABILITY TO CORN PLANTS

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp. 36-40 manuscript received  
22 Dec 75

KUKOBA, S. M., Ukrainian Scientific Research Institute for Soil Science and  
Agrochemistry

[Abstract] In vegetation experiments involving the interaction of elevated doses of phosphorus fertilizers with chernozem, gradual and slight regrouping occurs between fractions of mineral phosphates. Al-P and Fe-P participate most greatly in the nutrition of the plants. The fraction of participation of loosely bound phosphates and Al-P increases with increasing doses of fertilizer. The utilization of Fe-P by the plants is independent of the fertilizer dose. The fraction of basic Ca-P has no essential significance in the soil-solution system as a direct source of nutrition for the plants. The total of active fractions does not change over the course of 2.5 years. The Al-P and Fe-P fractions represent 80 to 90% of the total sum of phosphates utilized. The data produced confirm the possibility of applying elevated doses of phosphorus fertilizers to chernozem soil to form a reserve which will remain in the soil over a number of years. 17 references

## Nitrogen Compounds

USSR

UDC 547.759.4.07:543.422.25

INDOLIZINES. 4. PROTONATION OF 2-ALKYL(ARYL)-6- AND 7-CARBETHOXYINDOLIZINES AND THEIR FORMYL, ACETYL AND NITROSO DERIVATIVES

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 11, Nov 76  
pp 1540-1545 manuscript received 2 Dec 75

ALEKSEYEVA, L. M., DVORYANTSEVA, G. G., GOYZMAN, M. S., LOSEVA, T. S.,  
YANINA, A. D., MIKHLINA, YE. YE., SHEYNKER, YU. N., and YAKHONTOV, L. N.,  
All-Union Scientific Chemical-Pharmaceutical Research Institute imeni  
S. Ordzhonikidze, Moscow

[Abstract] Based on the PMR spectroscopical data, it has been established that 2-alkyl(aryl)-6- and 7-carbethoxyindolizines are protonated at C<sub>3</sub>, while their 3-formyl, 3-acetyl and 3-nitroso derivatives--at the oxygen atom of the substituent at position C<sub>3</sub>. Ionization constants of 24 indolizine derivatives were determined by potentiometric titration in nitromethane, using diphenylguanidine as a standard. The protonation correspondence to electrophilic substitution processes has been determined for a series of 2-alkyl(aryl)-6- and 7-carbethoxyindolizines. Tables 2; figures 2; references 6: 5 Russian, 1 Western.

USSR

UDC 547.759.3'743.1.07:542.951

REACTION OF INDOLES WITH ALDEHYDES. SYNTHESIS OF DIHYDROPYRROLO-[3,4-b]INDOLES

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 11, Nov 76  
pp 1516-1523 manuscript received 11 Sep 75 and after revision 9 Mar 76

KOGAN, N. A., VLASOVA, M. I., Leningrad Chemical-Pharmaceutical Institute

[Abstract] Aromatic aldehydes react with 1-methylindole-2-carbethoxy amides to form 1-aryl-4-methyldihydropyrrolo[3,4-b]indolones-3 under conditions of acid catalysis. Intermediate products -- 1-methyl-2-CONHR-3-( $\alpha$ X-benzyl)-indoles--have been isolated. O-Acetyl derivatives were obtained from the reaction of acetic anhydride with derivatives of unsubstituted amides. Dihydropyrrolo[3,4-B]indolones-3 were reduced with LiAlH<sub>4</sub> to respective dihydropyrrolo[3,4-b]indoles, and a mechanism of the formation of these compounds has been proposed. Tables 4; figure 1; references 6: 4 Russian, 2 Western.

USSR

UDC 547.853.7'854'752:542.958

INDOLE DERIVATIVES. 109. 5-(INDOLYL-3)-4-AMINO-6-OXYPYRIMIDINES

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 11, Nov 76  
pp 1513-1515 manuscript received 2 Dec 75

ROZHKOV, V. S., SMUSHKEVICH, YU. I., and SUVOROV, N. N., Moscow

[Abstract] Extending the classical synthetic method of Franke to 1-carbmethoxyindolyl-3-cyanoacetic ester led to a series of 5-(indolyl-3)-4-amino-6-oxypyrimidines with various substituents at the 2-position of the pyrimidine ring. Reaction with amidines, guanidine and thiourea gave alkyl and 2-aryl-5-(indolyl-3)-4-amino-6-oxypyrimidines as well as 2-amino and 2-thio-5-(indolyl-3)-4-amino-6-oxypyrimidine respectively. No tables or figures, references 6: 3 Russian and 3 Western.

USSR

UDC 547.298'75

CONVERSION OF DIARYLGLYCOLIC ACID 2-ACYL-1-ARYLHYDRAZIDES INTO 1-ACYLAMINO-3,3-DIARYLOXYINDOLES

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 9, Sep 76  
pp 1215-1217 manuscript received 18 Aug 75

BERDINSKIY, I. S., and NEZHDANOV, V. K., Perm State University imeni A. M. Gor'ki

[Abstract] In presence of concentrated sulfuric acid, 2-acetyl- or 2-formyl-1-arylhydrazides of diacylglycolic acids cyclize into 1-acylamino-3,3-diaryloxyindoles through an intermediate formation of a halochromic salt. Figure 1; table 1; references 7: 5 Russian, 2 Western.

USSR

UDC 547.759.3'852:542.951

ACETYLATION OF PYRIDAZINO[4,5-b]INDOLES AND THEIR DI- AND TETRAHYDRO-DERIVATIVES. 3.

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 9, Sep 76  
pp 1218-1222 manuscript received 25 Jul 75

VLASOVA, M. I., and KOGAN, N. A., Leningrad Chemical-Pharmaceutical Institute

[Abstract] Acetylation of pyridazine[4,5-b]indolones-4 with acetic anhydride leads to the formation of O-acetyl derivatives; when

1,2-di-hydropyridazine[4,5-b]indolones-4 were used in this reaction, the products were 2-acetyl and 2,4-diacetyl derivatives, depending on the reaction conditions. Tetrahydropyridazino[4,5-b]indoles, obtained by reduction of dihydroderivatives, are acetylated in position C-2. Table 1; figure 1; references 7: 4 Russian, 3 Western.

USSR

UDC 547.756:543.422.4

RING-CHAIN TRANSFORMATIONS WITH PARTICIPATION OF THE C=N GROUP. 5.  
REACTIONS OF 2-(tert-BUTYL)-3-CHLORO-3-(p-CHLOROPHENYL)ISOINDOLINONE WITH AMINES

Riga KHIMIYA GETEROTSIKLICHESKIKH SOYEDINENIY in Russian No 9, Sep 76  
pp 1207-1210 manuscript received 25 Sep 75

VALTER, R. E., and KARLIVAN, G. A., Riga Polytechnical Institute

[Abstract] It has been established that in the reactions of 2-(tert-butyl) 3-chloro-3-(p-chlorophenyl)-isoindolinone with methyl- and ethylamines, the attack of the nucleophilic agent occurs at C-1, followed by ring opening and a new cyclization resulting the formation of 2-alkyl-3-(tert-butylamino)-3-(p-chlorophenyl)isoindolinones. Lowered nucleophilicity of the amine group or increased size of the substituent on the nitrogen atom leads to a nucleophilic substitution at C-3. Using 2-(tert-butyl)-3-phenylamino-3-(p-chlorophenyl)isoindolinone as a test case, thermal isomerization of aminolactam into the amide of iminocarboxylic acid has been observed for the first time. Structures of the new compounds were established by the IR-data. Table 1; references 7: 4 Russian, 3 Western.

USSR

UDC 615.214.32:547.751

PHARMACOLOGICAL ACTIVITY OF PYRIMIDOINDOLE DERIVATIVES

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 39, No 6, Nov/Dec 76  
pp 651-655 manuscript received 25 Nov 75

ARTEMENKO, G. N., VIKHLYAYEV, YU. I., KUCHEROVA, N. F., and BORISOVA, L. N.,  
Laboratory of Psychopharmacology and Organic Synthesis of the Institute of Pharmacology, Academy of Medicinal Sciences USSR, Moscow

[Abstract] Psychotropic activity of a number of pyrimidoindole derivatives and their structure-activity relationship was studied on mice using tests

normally applied in estimation of the neuroleptic and antidepressant activity of the compounds with tricyclic structure. The indole derivatives studied exhibited sedative action. 5-Methyl derivatives of the pyrimido- and tetrahydropyrimido[3,4-a]indole with no substituent on the 1-2 position are antagonists of the 5-hydroxytryptophan, while 2,5-dimethyltetrahydropyrimidino[3,4-a]indoles potentiate selectively the central effect of 5-hydroxytryptophan and in general exhibit properties resembling the antidepressants. In general, the test compounds were found to be inferior to amitriptyline and pyrasidol. Figures 2; table 1; references 11: 6 Russian, 5 Western.

USSR

UDC 540.062+546.831+541.49

STUDY OF FORMATION OF COMPLEXES IN THE SYSTEM IRON-(III)-N-(5-METHOXY-PYRIMIDYL-2-AMINOCARBONYL)-N, N-DIETHYLENETRIAMIDOPHOSPHATE USING THE METAL-INDICATOR METHOD

Ivanovo KHIMIYA I KHIMICHESKAYA TEKHOLOGIYA in Russian Vol 19, No 9, 1976  
signed to press 12 Jun 75 pp 1360-1363

SHTOKALO, M. I., PYATNITSKIY, I. V., GUBNITSKAYA, YE. S., and BUTOVA, G. L.,  
Kiev Technological Institute of the Food Industry; Department of Analytical  
Chemistry, Kiev State University, Institute of Organic Chemistry, Academy  
of Sciences Ukr SSR

[Text-Russian language abstract supplied by authors] The metal indicator method was used to study the ferric iron complex (A) cited in title in equilibrium with a stained iron complex with xylene orange (XO). Shift of the equilibrium with the metal indicators demonstrated formation of a complex with the component ratio  $FE:XO=1:3$ . The equilibrium constant of formation of the complex  $FeA_3$  is equal to  $(4.7 + 1.3) \times 10^{-8}$ . A procedure was devised for photometric determination of  $(0.2-2.4) \times 10^{-3}$  mol/l of preparation A based on the weakening of coloration of the indicator system of iron (III) with XO under the action of A. The mean error of the determination when  $n=10$  does not exceed 10% of percentage errors. Figures 3; table 1; references 7: 5 Russian, 2 Western.

USSR

UDC 543.253:546.821:547.478

FEATURES OF CATALYTIC WAVES OF  $BrO_3^-$  AND  $ClO_3^-$  IN SOLUTIONS OF Ti (IV) COMPLEX WITH ALPHA-HYDROXY-ALPHA-DIBUTYLPHOSPHINOXIDOPROPIONIC ACID

Ivanova KHIMIYA I KHIMICHESKAYA TEKHOLOGIYA in Russian Vol 19, No 9, 1976  
signed to press 30 Jun 75 pp 1364-1367

MIFTAKHOVA, A. KH., ZABBAROVA, R. S., SABITOVA, Z. A., and TOROPOVA, V. F.,  
Department of Analytical Chemistry, Kazan State University imeni V. I.  
Ul'yanov Lenin

[Abstract] Some complex-forming reagents can activate catalytic electrochemical processes. In some cases, inhibition of the catalytic-effect is seen upon introduction of complex forming additives. The activating, and inhibiting effects on the catalytic waves of oxidants can be used to increase the sensitivity or selectivity of analytical determinations based on measurement of catalytic currents. The authors have studied catalytic waves of bromate and chlorate which form in the presence of a complex of Ti (IV) with the cited propionic acid derivative. Rate constants of the catalytic processes were calculated (asymptotic equation of Koutetskiy). The catalytic wave of bromate can be used to assay small concentrations of Ti (IV). Figures 3; tables 3; references 11: 10 Russian, 1 Western.



## THE INTERACTION OF TERTIARY-ARSINE SULFIDES WITH CHLOROCARBONIC-ACID ALKYL ESTERS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian No 11, Nov 76 pp 2555-2558  
manuscript received 17 Apr 75

IONOV, L. B., KOROVYAKOV, A. P., and MOLODTSOV, S. S., Udmurt State  
University imeni 50th Anniversary of the USSR

[Abstract] In the continuation of a study of tertiary-arsine chiral sulfide conversions under the action of various electrophilic reagents, an attempt has been made to study the reaction of dialkylaryl arsine sulfate with chlorocarbonic-acid alkyl esters. There was studied the reaction of methylethylphenyl arsine sulfide with a chlorocarbonic-acid methyl ester. There was isolated a quasi-arsonium salt which is an intermediate product of the investigated reaction and the products of its thermal decomposition. It is shown that the interaction of tertiary-arsine sulfides with chlorocarbonic-acid alkyl esters proceeds in different directions, depending upon the temperature. Products of thermal isomerization of the quasi-arsonium salt and products of other competing reactions, which are compounds not previously described, are isolated and characterized. References: 6 Russian.

USSR

UDC 541.124+541.127+661.718.1

KINETICS OF THE REACTION OF PHOSPHITES WITH HYDROPEROXIDES AND FREE RADICALS

Ivanova KHIMIYA I KHIMICHESKAYA TEKHOLOGIYA in Russian Vol 19, No 9, 1976  
signed to press 17 Jun 75 pp 1387-1389

ZAYCHENKO, L. P., BABEL', V. G., SMIRNOV, P. A., and PROSKURYAKOV, V. A.,  
Department of Petroleum Technology and Carbon Chemical Production, Leningrad  
Technological Institute imeni Lensovet

[Abstract] Esters of phosphorous (PA) and pyrocatecholphosphorous acids (PYA) are active antioxidants in a hydrocarbon medium. The inhibiting action is due to their ability to react with hydroperoxides and free radicals, i.e., to participate in the inhibition of oxidizing free-radical processes. The authors have studied the kinetics of the interaction of a series of the PA and PYA esters with cumole hydroperoxide and with the Koplinger radical. These reactions proceed as a first order with respect to each reactant, and their speed is a function of the nature of the substituent on the phosphorus atom. Reaction rate constants are determined for the esters and radical. Figures 2; tables 2; references: 7 Russian.

USSR

UDC 547.26.118

REACTIONS OF PHOSPHORUS ACID DICHLOROMETHYLENEIMIDES WITH o-PHENYLENE-DIAMINE AND THE SODIUM SALT OF o-AMINOTHIOPHENOL

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, 1976 pp 23-24  
manuscript received 16 Jun 74

ARIPOV, A., GRAPOV, A. F., and MEL'NIKOV, N. N., All Union Scientific  
Research Institute of Chemical Plant Protective Agents, Order of the  
Labor Red Banner, Institute of the Chemistry of Natural Products, Academy  
of Sciences UzSSR

[Abstract] Reaction of dichloromethyleneamides of the 0,0-diethylphosphoric and 0-phenylmethylphosphonic acids with o-phenylenediamine and sodium salt of o-aminothiophenol yields 2-phosphinylamidobenzimidazoles or corresponding benzthiazoles. The structures of these products were proven by IR-spectroscopical data. No tables or figures; references: 3 Russian.

USSR

UDC 542.91:547.556.7:547.558

REACTION OF PHENYLDIAZONIUM FLUOROBORIDE WITH PENTAPHENYLPHOSPHORUS,  
PENTAPHENYLARSENIC AND PENTAPHENYLANTIMONY

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No 10,  
Oct 76 pp 2397-2398 manuscript received 17 Jun 76

NESMEYANOV, N. A., MIKUL'SHINA, V. V., and REUTOV, O. A., Moscow State  
University imeni M. V. Lomonosov

[Abstract] Pentaphenyl derivatives of phosphorus, arsenic and antimony react with equimolar quantities of diazonium fluoroboride in THF-acetonitrile or in acetonitrile-toluene mixtures at 20° to form tetraphenylonium salts and azobenzene in 60-80% yields. No tables or figures; references 4: all Western.

USSR

UDC 541.124:542.941:542.92:547.1'118

ERP STUDY OF THE REDUCTION AND SPLITTING OF TRIPHENYLPHOSPHINE BY ALKALINE  
METALS

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No 10,  
Oct 76 pp 2387-2389 manuscript received 20 Apr 76

ASIROV, R. N., SOLODOVNIKOV, S. P., and KABACHNIK, M. I., Institute of Metal  
Organic Compounds, Academy of Sciences USSR, Moscow

[Abstract] The splitting of triphenylphosphine by alkaline metals in ether goes through the stage of the formation of triphenylphosphine anion radical, as shown by the EPR data. The EPR spectra of tetraphenyldiphosphine anion radical have been studied. Figures 3; references 8: 4 Russian, 4 Western.

USSR

UDC 542.91:547.1'118

REACTION OF TRIMETHYLPHOSPHITE WITH BENZALACETOPHENONE AND BENZAL- $\alpha$ -TATRALONE

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA KHIMICHESKAYA in Russian No 10, Oct 76 pp 2369-2371 manuscript received 2 Apr 76

ARBUZOV, B. A., FUZHENKOVA, A. V., and TUDRIY, G. A., Chemical Institute imeni A. M. Butlerov, Kasan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] Benzalacetophenone (chalcone) and benzal- $\alpha$ -tetralone, upon prolonged heating at 50-60° with trimethylphosphite, form thermally unstable compounds with pentacoordinated phosphorus - the 1,2-oxaphospholenes-4. Figure 1; references 3: all Russian.

USSR

UDC 547.241+547.362

SYNTHESIS OF DIALLYL AND DIPROPARGYL ESTERS OF  $\alpha$ -AMINOPHOSPHONIC ACIDS

Alma-Ata IZVESTIYA AKADEMII NAUK KAZAKHSKOY SSR, SERIYA KHIMICHESKAYA in Russian No 5, Sep/Oct 76 pp 35-40 manuscript received 27 Feb 75

AZERBAYEV, I. N., deceased, DZHAYLAUOV, S. D., and BOSYAKOV, YU. G., Institute of Chemical Sciences, Academy of Sciences Kazakh SSR, Alma-Ata

[Abstract] Diallyl and dipropargyl phosphites react with cyclohexanone, 2,2-dimethyltetrahydropyranone-4, 1,2,5-trimethylpiperidone-4 and ammonia to give unsaturated esters of  $\alpha$ -aminophosphonic acids. Substitution of secondary amines -- diethylamine and morpholine -- for ammonia in this reaction results in mixtures of esters of  $\alpha$ -amino- and  $\alpha$ -oxyphosphonic acids. By varying the order of adding the reagents, the temperature and the duration of the reaction, preferential formation of  $\alpha$ -aminophosphonic acid esters can be achieved. A series of diallyl and dipropargyl esters without substituents associated with the nitrogen atom are synthesized as well as N-substituted esters of  $\alpha$ -aminophosphonic acids of the cyclohexane, pyran and piperidine series. References 7 Russian.

USSR

UDC 661.718. + 662.766

# SYNTHESIS OF PHOSPHONATES BASED ON ACETYLENE ALCOHOLS

Frunze IZVESTIYA AKADEMII NAUK KIRKIZSKOY SSR in Russian No 5, 1976 pp 50-51  
manuscript received 20 May 76

BEYSHEKEYEV, ZH., ASHYMBAYEVA, B., and DZHUNDUBAYEV, K., Institute of Organic Chemistry, Academy of Sciences Kirgizskoy SSR

[Abstract] Reaction of dimethyl, cyclohexyl, and cyclopentylethynyl-carbinols with  $\beta$ -ethoxyvinylthiophosphonic acid dichlorides in ether in presence of pyridine gave corresponding phosphonates. Their structures were determined by elemental analysis, IR spectroscopy and TLC over alumina (solvent system used: petroleum ether-benzene 4:1). No tables or figures, references 5: all Russian.

USSR

UDC 541.67L547.241

# EVIDENCE OF A BIPOLAR STRUCTURE FOR 1-AMINOETHANE-1,1-DIPHOSPHONIC ACID

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR -- SERIYA KHIMICHESKAYA in Russian No 5, 1975 pp 590-592 manuscript received 20 Oct 75

MAI, L. A., and LUKEVITS, O. K., Institute of Inorganic Chemistry Latvian SSR

[Abstract] The determination of the dipole increment (DI) and dipole moment (DM) of 1-aminoethane-1,1-diphosphonic acid is reported. The DM was determined in dioxane at 40° using the Higasi method. The large values of DM, about 15 D, and DI,  $31 \pm 5$ , indicate a bipole, zwitterion, structure. This contrasts with a DM of  $4.47 \pm 0.08$ D for tetraethyl-1-hydroxyethane-1,1-diphosphonate in benzene. Tables 1; references 16: 8 Russian, 8 Western.

## ON THE PRODUCT OF THE REACTION BETWEEN DIMETHYLPHOSPHITE AND PYROCATECHOL

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR -- SERIYA KHIMICHESKAYA in Russian No 5, 1976 pp 611-613 manuscript received 14 Mar 75

DREYMAN, YA. A., LUKEVITA, O. K., and MAI, L. A., Institute of Inorganic Chemistry Academy of Sciences Latvian SSR

[Abstract] The reaction of pyrocatechol with dimethylphosphite was studied. Hydrogen evolution was observed on heating the reactants. Vacuum distillation was used to isolate a product identified by IR and  $^1\text{H}$  and  $^{13}\text{C}$  NMR as a monocyclic oxaphosphorane. The marked distance of the proton signals from the benzene ring indicates clear nonequivalence, while the aromatic system is completely conserved. The marked decrease in  $J_{\text{H-C-O-P}}$  is due to the predominance of the cisoid conformation. The data indicate that the reaction proceeds with preservation of the  $\text{OCH}_3$  groups on the phosphorus and without phenol-dieneone rearrangement. Figures 2; references 7: all Russian.

USSR

UDC 632.954

METHOD OF DETERMINATION OF RESIDUAL QUANTITIES OF THE HERBICIDE ALVISON

Moscow AGROKHIMIYA in Russian No 10 Oct 76 pp. 129-131 manuscript received 9 Jan 76

PEGUKHOVA, N. P., ARISTOVA, N. Ye. and PRILEZHAYEVA, Ye. N., Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences USSR

[Abstract] A method is developed for determination of the herbicide alvison in the soil and in carrots, based on extraction of the preparation from the sample being studied by a solvent, purification of the extract in a column with silica gel with subsequent thin-layer chromatography. The determination is performed by visual comparison of the intensity of coloration of spots of the sample and of standard solutions. The method has been successfully used for determination of the mitration of the herbicide alvison in soil horizons. 4 references.

USSR

UDC 661:632.951

MATHEMATICAL MODEL OF KINETICS OF SYNTHESIS OF HEXACHLOROCYCLOHEXANE UNDER ISOTHERMAL CONDITIONS

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 10-14

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220288 by the authors]

BULANKIN, R. P., KRASOTIN, Yu. I., PAKHOMOV, V. A.

[Text] A study is made of a simplified mathematical model of the kinetics of photochemical synthesis of four basic isomers of HCCH under isothermal conditions. The process is conducted in a solution of  $\text{Cl}_2$  in  $\text{C}_6\text{H}_6$ . The model is a system of 20 linear differential equations of pseudofirst order. The equation system is solved numerically by the Runge-Kutta method on a digital computer. The model produced agrees satisfactorily with the experimental data.

USSR

#### OPTIMIZATION OF THE PROCESS OF PRODUCTION OF DIALKYLCHLOROTHIOPHOSPHATE

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 14-16

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220289 by the authors]

ANDREYEV, V.S., BARABASH, N.D., DOMRACHEVA, L.G., ZUBKOVA, T.P., KRASOTIN, Yu. I., FEDOROVA, G.N.

[Text] This work analyzes the possibility of using the method of mathematical planning of experiments to optimize the process of production of methylethylchlorothiophosphate (an intermediate in the production of trichlorometaphos) under laboratory conditions. The input variable parameters are process temperature, quantity of methanol and quantity of alkali fed into the reactor, the optimization parameters are the content of dialkylchlorothiophosphate in the reaction product and its yield as 100%. The optimization of the process performed by the method of experimental planning causes the yield of the end product to increase from 82 to 84% while simultaneously reducing the consumption of MeOH by 1.6 times.

USSR

#### OPTIMIZATION OF THE PROCESS OF PRODUCTION OF FOKSIM

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 20-24

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220290 by the authors]

ARKATOVA, N. N., PERLOVA, T. G., SHVETSOVA-SHILOVSKAYA, K. D.

[Text] The preparation foksim is a leaf and soil insecticide, and is also used against ecto- and endoparasites on animals and for moth control. The active ingredient of the preparation foksim is 0,0-diethylthiophosphoryloxy- $\alpha$ -cyanobenzaldoxime. A technology has been developed for production of foksim by the method of statistical planning of experiments. The initial raw material used is the Na salt of  $\alpha$ -cyanobenzaldoxime (I) and diethylchlorothiophosphate (II). An equation is produced adequately describing the process, and a study of the response surface described by the equation performed. The optimal conditions are determined for production of foksim with a yield as the active ingredient of 94-96%. The optimal mode is achieved with the following values of parameters: molar ratio I:II = 1.2; reaction temperature 28-30 C; II feed time 25-30 minutes; holding time 60 minutes. The reaction is conducted in ac, then the reaction mass is poured into cold water and extracted with benzene. The quantity of ac, water and benzene is 50 ml each (for 0.06 mol I).



USSR

HETEROPHOS -- A SOIL NEMATOCIDE

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 65-76

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220291 by the authors]

GAR, K.A., MANDEL'BAUM, Ya.A., GUSHCHIN, B.Ye., TREML', A.G., BAKANOVA, Z.M., CHUMAKOVA, V.I., NIKITIN, V.S.

[Text] The results are presented from testing of heterophos (I, O-ethyl-O-phenyl-S-propylthiolphosphate). I was found to be highly effective against gall nematodes, potato cyst-forming and stem and other types of nematodes, equal to nemakur, lannate, temik, etc. The consumption norms of the preparation are from 5 to 30 kg/ha (as active ingredient). Intensifying and accelerating the development of plants, I increases their disease resistance. No residues of I were found in the vegetables.

USSR

STUDY OF CERTAIN BIOLOGICAL PARAMETERS IN HOUSEFLIES RESISTANT TO ORGANOPHOSPHORUS INSECTICIDES

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 96-105

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220294 by the authors]

ROSLAVTSEVA, S.A., POKYAKOVA, V.K., AGASHKOVA, T.M., MOGIL'NIKOVA, G.F.

[Text] Reduced viability of all phases of development of houseflies resistant to gardon and chlorophos is established. The process of loss of resistance in similar races under natural conditions without the influence of insecticides will occur quite rapidly. In flies resistant to cumaphos, all phases have elevated or equivalent viability as the phases of development of the sensitive population. The loss of resistance to cumaphos under natural conditions will occur more slowly, and the accumulation of resistant populations is possible.

USSR

# STABILIZATION OF DDT SUSPENSIONS BY SURFACTANTS

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 41-46

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220296 by the authors]

BEZUGLYI, S.F., KLIMENTOVA, L.P., KRAKHALEVA, K.M.

[Text] The process of production of wetting or water-dispersing powders consists in combined fine grinding of the active ingredient, inert filler, anion-active surfactant and dispersing agent in an air-jet mill. A recipe has been developed for DDT (75%) stabilized by sodium methyleleithauride. However, upon storage the stability of the suspension decreases somewhat. Further studies have resulted in the development of a composition of DDT (75%) based on the Na salt of the product of condensation of saturated fatty acids  $\text{RCOOCH}_2\text{CH}_2\text{SO}_3\text{Na}$  ( $\text{R}=\text{alkyl}$ ). Suspensions of DDT produced by this method are stable for 14 months.

USSR

# ANALYSIS OF REACTION MASSES, THE TECHNICAL PRODUCT AND PREPARATION FORMS OF THE REPELLENT OXAMATE

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 59-62

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220301 by the authors]

BUYANOVSKAYA, P.G., SKVORTSOVA, A.Ye., RUBTSOVA, Ye.S., KHRISTYUK, L.F., VOLCHEK, A.R.

[Text] A method of quantitative determination of the repellent  $\text{Et}_2\text{NOCCOOR}$  ( $\text{R}=\text{alkyl}$ ) is based on acid hydrolysis of the product with subsequent determination of diethylamine.

USSR

METHOD OF PRODUCTION OF 3-INDOLYLPHOSPHONIC OR PHOSPHONOUS ACID

USSR AUTHOR'S CERTIFICATE NO. 458558, FILED 29/05/72, NO. 1789503, PUBLISHED 27/11/75 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220315 by T.Ya. Ogibina]

RAZUMOV, A.I., GUREVICH, P.A., BAYGIL'DINA, S.Yu.

[Text] A method is suggested for production of physiologically active esters of 3-indolylphosphonic (I) and 3-indolylphosphonous (II) acids. Example. To an ether solution of N-indolylmagnesium iodide (of 0.05 mol Mg, 0.05 mol MeI and 0.05 mol indole), 0.05 mol of an ether solution of diphenylchlorophosphate is added. The mixture is boiled for 2 hours, cooled, a 10% solution of  $\text{NH}_4\text{Cl}$  is added and ether extraction is performed. The extract is dried, evaporated and by distillation 9.5 g of I diphenylether is produced,  $\text{C}_{20}\text{H}_{16}\text{NO}_3\text{P}$ , b.p. 202-2 C/0.7, m.p. 54-5 C. Under similar conditions, one can produce esters of II (given are ester, empirical formula, yield in %, b.p. in C/mm,  $n^{20}_D$  and  $d^{20}_4$ ): dibutyl,  $\text{C}_{16}\text{H}_{24}\text{NO}_2\text{P}$ , 40.1, 122-4/2, 1.5311, 1.0571; diamyl,  $\text{C}_{18}\text{H}_{28}\text{NO}_2\text{P}$ , 46.2, 120-2/2, 1.5018, 0.9985.

USSR

A METHOD OF PRODUCTION OF N-CARBALCOXYHYDRAZONES OF CHLORONITROFORMALDEHYDE

USSR AUTHOR'S CERTIFICATE NO. 453398, FILED 23/05/73, NO. 1924694, PUBLISHED 10/09/75 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) Abstract No. 220324 by T.Ya. Ogibina]

MARKOVSKIY, V.I., MARCHENKO, G.A., NOVIKOV, S.S., SLOVETSKIY, V.I.

[Text] A method is suggested for production of substances of the formula  $\text{ROOCNH}=\text{C}(\text{NO})_2\text{Cl}$  (I) ( $\text{R}=\text{alkyl}$ ), which can be used as insecticides, herbicides and pharmaceuticals. Example. Through a suspension of 1 weight part piperidic salt of dinitroformaldehyde N-carboethoxyhydrazone in 15 weight parts ether at  $15\pm 2$  C, pass  $\text{HCl}$  (gas) until the salt is fully clarified. The piperidine  $\text{CH}$  is separated, the filtrate is evaporated, producing 0.55 weight parts I ( $\text{R}=\text{Et}$ ),  $\text{C}_4\text{H}_6\text{ClN}_3\text{O}_4$ , m.p. 104-5 (dec;  $\text{CCl}$  ).

USSR

EFFECTIVENESS OF N,N-DIALKYL-N'-ARYLGUANIDINES AGAINST POWDERY MILDEW OF CUCUMBERS

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 76-80

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220337 by the authors]

SANIN, M.A., KISELEV, L.A., MEL'NIKOV, N. N.

[Text] A study is made of the protective contact effect of N,N-dialkyl-N'-arylguanidines against powdery mildew of cucumbers. A number of compounds are discovered which are similar in effectiveness to caratan (ethanol). A study is made of the dependence of their fungicidal effect on the nature of the aliphatic group and substituent in the aromatic ring. It is established that most active among the N,N-dialkyl-N'-arylguanidines are compounds having at least one of their methyl groups in the aliphatic group. Branching of the aliphatic chain of the alkyl group did not lead to an increase in the fungicidal effect. The introduction to the phenyl group of such substituents as chlorine, bromine or trifluoromethyl significantly increased the effectiveness in comparison to methyl-, methoxy-, nitrophenyl derivatives and unsubstituted phenylguanidine.

USSR

EFFECTIVENESS OF THE HERBICIDES ACETLUR AND DALUR FOR SUGAR BEETS

Moscow KHIM. SREDSTVA ZASHCHITY RAST. [CHEMICAL SUBSTANCES FOR PLANT PROTECTION -- COLLECTION OF WORKS] in Russian No. 6, 1976 pp 86-92

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 22 (II) 1976 Abstract No. 220351 by the authors]

RADTSEV, V.S., MALYUTIN, P.P., STONOV, L.D., ZHARKOV, V.I.

[Text] Results are presented from a study of the combined herbicides acetlur (TCA + hexylur) and dalur (propinate + hexylur) in sugar beet fields in Bashkiria. The preparations caused the death of 77-100% of monocotyledonous and dicotyledonous annual weeds with a consumption norm of 4-6 kg/ha. Sugar beet fields were practically weed-free throughout the vegetation period, the fields were simply treated between rows, no manual labor being required. The herbicides increased the harvest of sugar beets and reduced manual labor consumption, providing a profit of 61-131 rubles/ha. Herbicide residues were not found in the sugar beets. The preparations are recommended for application.

USSR

#### A METHOD OF PRODUCTION OF ARYLCHLOROPHOSPHITES

USSR AUTHOR'S CERTIFICATE NO. 485120, FILED 27/05/74, NO. 2027734, PUBLISHED 15/12/75 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200289P by B. Ya. Chvertkin]

BLIZNYUK, N.K., KVASHA, Z.N., CHVERTKINA, L.V.

[Text] Compounds of the formula  $(X_mC_6H_5-mO)_nPCl_{3-n}$  (I) ( $X=Cl$ , alkyl,  $m=1-3$ ,  $n=1-2$ ) are produced by the interaction of  $PCl_3$  (II) with phenols in the presence of catalytic quantities of tetraphenylphosphonium bromide (III) or tetrabenzylphosphonium chloride. Example. To a mixture of 10 ml II and 40 mg III at 60-65 C, add, over the course of one hour, a solution of 0.05 mol 2,4,5-trichlorophenol in 25 ml II, boil 1 hour, distill, producing I ( $X_m=2,4,5-Cl_3$ ,  $n=1$ ), yield 71%, b.p. 124-7 C/0.5,  $n_D^{20}$  1.6030,  $C_6H_2Cl_5OP$ . Similarly, one can produce I (given are  $X_m$ ,  $n$ , yield in %, b.p. in C/mm,  $n_D^{20}$ , empirical formula): 2,6-(iso-Pr)<sub>2</sub>, 1, 79, 114-7/1, 1.5335,  $C_{12}H_{17}Cl_2OP$ ; 2-iso-Pr, 1, 69, 86-90/0.5, 1.5435,  $C_9H_4Cl_2OP$ ; 2,4- $Cl_2$ , 1, 68, 117-20/3, 1.5850,  $C_6H_3Cl_4OP$ ; 2,4- $Cl_2$ , 2, 46, 178-80/1, 1.6004,  $C_{12}H_6Cl_5O_2P$ .

USSR

#### METHOD OF PRODUCTION OF DIALKYLPHOSPHITES

USSR AUTHOR'S CERTIFICATE NO. 488820, FILED 13/06/74, NO. 2032536, PUBLISHED 14/01/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200290P by B. Ya. Chvertkin]

BLIZNYUK, N.K., PROTASOVA, L.D., SAKHARCHUK, T.A., KLOPKOVA, R.S., KLIMOVA, T.A.

[Text] A method is suggested for the production of higher dialkylphosphites by the reaction of reesterification of lower dialkylphosphites in the presence of quaternary ammonium compounds or their bis analogues, for example methylviologendichloride (I), tetramethylammonium iodide, cetylpyridinium chloride. Example. A mixture of 0.1 mol dimethylphosphite, 0.24 mol heptyl alcohol and 1 mol % I is heated in a stream of  $N_2$  at 130-150 C 2 hours, evaporated and distilled, producing diheptylphosphite, b.p. 156-8 C/2,  $n_D^{20}$  1.4380,  $d_4^{20}$  0.9370, yield 85%. Similarly, one can produce [given are substance,  $n_D^{20}$ ,  $d_4^{20}$ , yield in %, b.p. in C/mm and empirical formula]: di-(2-ethylhexyl)-phosphite, 1.4430, 0.9330, 93, 168-70/2; dioktylphosphite, 1.4418,

0.9311, 85, 188-9/2-3; di-(butoxyethyl)-phosphite, 1.4400, 1.0427, ~100, 162-6/2-3,  $C_{12}H_{27}O_5P$ ; di-(butoxyethoxyethyl)-phosphite, 1.4401, 1.0490, ~100, 182-90/2-3 (dec.),  $C_{16}H_{35}O_7P$ ; di-(2-ethylmercaptoethyl)-phosphite, 1.5069, 1.1601, 96,  $C_8H_{19}O_3PS_2$ ; di(alkylphenylpolyglycol)-phosphite (based on OP-7), 1.4877, 1.0725, 100,  $C_{58}H_{103}O_{17}P$ .

USSR

UDC 661:632.951

A METHOD OF PRODUCTION OF DIHALIDES OF 3-HALIDE-2,2-DIMETHYLPROPYLPHOSPHORIC ACID

USSR AUTHOR'S CERTIFICATE NO. 488823, FILED 13/06/74, NO. 2032535, PUBLISHED 24/08/75 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200291P by B. Ya. Chvertkin]

BLIZNYUK, N.K., KVASHA, Z.N., CHVERTKINA, L.V.

[Text] Compounds of the formula  $XCH_2C(Me)_2CH_2OP(O)X_2$  (I) ( $X=Cl$  or  $Br$ ) are produced by interacting 2,2-dimethylpropane-1,3-diol (II) with the corresponding phosphorus trihalide and halide in an organic solvent at 0-45 C. Example. To a solution of 0.1 mol  $PBr_3$  in 20 ml  $CH_2Cl_2$  at 0-6 C, add a solution of 0.1 mol II in 50 ml  $CH_2Cl_2$ , mix 40 min at 20 C, then at 25-35 C add 0.1 mol  $Br_2$  in 5 ml  $CH_2Cl_2$ , boil 30 minutes, remove the solvent, distill, producing I ( $X=Br$ ), m.p. 130-2 C/l,  $n_D^{20}$  1.5280,  $d_4^{20}$  1.9927, yield 76%,  $C_5H_{10}Br_3O_2P$ . Similarly, one can produce I ( $X=Cl$ ), b.p. 125-8 C/15,  $n_D^{20}$  1.4662,  $d_4^{20}$  1.3611, yield 80%,  $C_5H_{10}Cl_3O_2P$ .

USSR

UDC 661:632.951

A METHOD OF PRODUCTION OF CARBOMOYLIZED PHOSPHORYLACETIC ACID AMIDES

USSR AUTHOR'S CERTIFICATE NO. 461629, FILED 8/06/73, NO. 1932172, PUBLISHED 16/01/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200292P by T. I. Bobrova]

SUKHOVEYEVA, I.B., PUSHINA, M.Ya., SHVETSOVA-SHILOVSKAYA, K.D., MEL'NIKOV, N.N.

[Text] Compounds of the general formula  $(R)(R^1)P(S)XCH_2CONHCH(CCl_3)OCONHR^2$  (I) ( $R=C_1-C_4$  alkoxy,  $R^1=Me$ ,  $C_1-C_4$  alkoxy,  $R^2=$ unsubstituted or substituted alkyl,  $X=O,S$ ) are produced by reacting compounds of the formula

(R)(R<sup>1</sup>)P(S)XCH<sub>2</sub>CONHCH(CCl<sub>3</sub>)OH (II) with R<sup>2</sup>NCO in the presence of a catalyst (tin dibutyldiacetate) in an inert organic solvent at 0-100 C. Example. To a solution of 3.9 g II (R=R<sup>1</sup>=EtO, X=S) in C<sub>6</sub>H<sub>6</sub> at 20 C, add 0.63 g MeNCO, a few drops of catalyst, heat to 50 C for 3 hours, hold 1 hour at ~20 C, filter, evaporate, dry the residue 10 minutes at 45-50 C/0.5, producing 4.3 g I (R=R<sup>1</sup>=EtO, R<sup>2</sup>=Me, X=S), n<sup>20</sup><sub>D</sub> 1.5300, d<sub>4</sub><sup>20</sup> 1.3724, yield 98%. Similarly, one can produce I [X=S; given are R, R<sup>1</sup>, R<sup>2</sup>, yield in %, m.p. in C (solvent)]: EtO, EtO, Et, 98, 66-7 (eth.-petr. eth.); PrO, PrO, Me, 92, 75-7.5 (C<sub>6</sub>H<sub>6</sub>-hexane); iso-PrO, iso-PrO, Me, 74, 99-100 (eth.-petr. eth.); iso-PrO, iso-PrO, Bu, 96, 108-10 (petr. eth.); EtO, EtO, EtOCOCH<sub>2</sub>, 90, 67-9 (eth.-petr. eth.); EtO, Me, Me, 86, oil; X=O: iso-PrO, iso-PrO, Me, 85, n<sup>20</sup><sub>D</sub> 1.5065.

USSR

UDC 661:632.951

# A METHOD OF PRODUCTION OF S-ORGANO-O-ARYLAMIDOTHIOPHOSPHATES

USSR AUTHOR'S CERTIFICATE NO. 433156, FILED 7/10/71, NO. 1703217, PUBLISHED 20/01/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200295P by Ye. A. Karsanina] [End page missing -- Tr.]

BLIZNYUK, N.K., KVASHA, Z.N., CHISTOVA, G.I.

[Text] A method is suggested for production of compounds of the general formula 2-C(O)NR'R''-X<sub>n</sub>C<sub>6</sub>H<sub>4-n</sub>OP(O)SR(NR'R'') (I) (R=alkyl, aryl; R', R''=H, alkyl, aryl, aralkyl or R'R''N=heterocyclic group; X=halide; n=0-2). Example. To a solution of 0.016 mol (MeS)<sub>2</sub> in 10 ml CHCl<sub>3</sub> at a temperature from -30 to -25 C, add 0.016 mol Cl<sub>2</sub>, bring the temperature up to 20 C, add the solution produced to a solution of 0.03 mol salicylchlorophosphite in 10 ml CHCl<sub>3</sub> at a temperature of -20 to -15 C, bring the temperature up to 20 C, hold 1 hr, add a mixture of 0.06 mol Et<sub>2</sub>NH and 0.06 mol Et<sub>3</sub>N in 10 ml CHCl<sub>3</sub> at a temperature of -20 to -15 C, 3 hr agitate at 20 C, wash with water, evaporate, producing I (R=Me, X<sub>n</sub>=H, R'=R''=Et), n<sup>22</sup><sub>D</sub> 1.5380. Similarly and by other methods, one can produce I (given are R, R', R'' or R'R''N, n<sup>20</sup><sub>D</sub> or m.p. in C) X<sub>n</sub>=H: Et, Bu, Bu, 1.5136; Et, PhCH<sub>2</sub>, H, 1.5570; Pr, PhCH<sub>2</sub>, H, 1.5695; Pr, CH<sub>2</sub>=CHCH<sub>2</sub>, H, 1.5330; Pr, morpholino, 1.5416; Bu, Et, Ph, 1.5630; Bu, Me, PhCH<sub>2</sub>, 1.5620; iso-Bu, CH<sub>2</sub>=CHCH<sub>2</sub>, H, 1.5399; iso-Bu, morpholino, 1.5440; 2,5-Cl<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, PhCH<sub>2</sub>, H, n<sup>25</sup><sub>D</sub> 1.6105; 2-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, morpholino, X<sub>n</sub>=4,6-Cl<sub>2</sub>, 54-5 C; Bu, iso-Bu, H, X<sub>n</sub>=4,6-Cl<sub>2</sub>, 1.5320; Bu, piperidino, X<sub>n</sub>=4,6-Cl<sub>2</sub>, [remainder and all of pages 65-68 missing from material supplied for translation -- Tr.].

USSR

UDC 661:632.951

A METHOD OF PRODUCTION OF SUBSTITUTED  $\beta$ -(FURYL-2)- $\alpha$ -CHLORONITROETHYLENE

USSR AUTHOR'S CERTIFICATE NO. 491613, FILED 19/07/73, NO. 1951680, PUBLISHED 15/03/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200338P by T. Ya. Ogibina]

NAZAROVA, Z.N., POTEMKIN, G.F.

[Text] A method is suggested for production of substances of the formula

$\text{OCX}=\text{CYCZ}=\text{CCH}=\text{C}(\text{NO}_2)\text{Cl}$  (I) (X=H, Me, Cl, Br or I, Y=H, Cl or Br, Z=H, Br or Me), which can be used as insecticides, fungicides and in the synthesis of physiologically active substances. Example. Cool to  $-15^\circ\text{C}$  a solution of 0.1 mol furylnitroethylene in 50-100 ml dry  $\text{CCl}_4$ , bubble through  $\text{Cl}_2$  for 5-10 minutes, hold the mixture 10 minutes at the same temperature, evaporate the solvent, dissolve the residue in  $\text{C}_6\text{H}_6$  and pass through a column with  $\text{Al}_2\text{O}_3$ . This produces 1.73 g I (X=Cl, Y=Z=H),  $\text{C}_6\text{H}_3\text{Cl}_2\text{NO}_3$ , m.p.  $67-8^\circ\text{C}$ . Similarly, one can produce I (given are X, Y, Z, empirical formula, yield in % and m.p. in  $^\circ\text{C}$ ): J, H, H,  $\text{C}_6\text{H}_3\text{ClINO}_3$ , 96.5,  $109-9.5$ ; Me, H, H,  $\text{C}_7\text{H}_6\text{ClNO}_3$ , 68,  $36-7$ ; I, Br, H,  $\text{C}_6\text{H}_2\text{ClIBrNO}_3$ , 60.8,  $124-5$ ; Br, H, H,  $\text{C}_6\text{H}_3\text{ClBrNO}_3$ , 78,  $74-5$ .

USSR

UDC 661:632.952

NEW MEANS FOR CHEMICAL PROCESSING OF FURFURAL

Riga ISPOL'Z PENTOZANSODERZH SYR'YA [USE OF PENTOSAN-CONTAINING RAW MATERIAL -- COLLECTION OF WORKS] in Russian Zinatne Press 1976 pp 91-95

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200349 by Yu. I. Khol'kin]

KUL'NEVICH, V.G., BADOVSKAYA, L.A., ZELIKMAN, Z.I.

[Text] Experimental modes are developed for production of biologically active compounds such as lactones, dibasic and acylacrylic acids on the basis of furan compounds. Acetales are of practical interest. 2-(furyl-2)-1,3-dioxacyclanes have high fungicidal activity.



USSR

UDC 661:632.951

A MULTISTAGE CENTRIFUGAL APPARATUS FOR THE PRODUCTION OF EMULSIONS OF CERTAIN POISONS

KASKADNYY TSENTROBEZHNY APPARAT DLYA POLUCHENIYA EMUL'SIY NEKOTORYKH YADOKHIMIKATOV, Yaroslavl' in Russian 1976 Yaroslavl' Polytechnical Institute 6 pp

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200346Dep by the author]

ZAYTSEV, A.I.

[Text] Results are presented from a study of a three-stage centrifugal mixer as applicable to the production of green oil emulsions. Processing of experimental data by the method of experimental planning produces regression equations for the mean diameters of drops of the dispersed phase of the emulsion. It is shown that the number of stages of the mixture should not be greater than three, since the resistance of the emulsion subsequently increases but slightly and the reduction of drop diameters of the dispersed phase is not great.

USSR

UDC 661:632.954

MIGRATION OF PROMETHRIN AND CERTAIN PROBLEMS OF LABOR HYGIENE IN CONNECTION WITH ITS APPLICATION IN KAZAKHSTANE

TR. NII KRAYEV. PATOL. KazSSR IN Russian 1976 Vol. 29 Part 1 pp 137-140

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200378 by Ya. B. Zelikhov]

NEKRASOVA, A.S., MAYOROVA, R.I.

[Text] A study is presented of the behavior of promethrin in the environment (water, soil) and its interrelationship with agricultural crops from the beginning to the end of the vegetation period. It is shown that under conditions of irrigated agriculture as in Alma-Ata Oblast, the preparation can be conserved in the soil to a depth of 0-10 and 20-30 cm for up to three months. Its content in agricultural crops depends on the weather conditions. The water collected after irrigation of fields treated with promethrin does not contain the preparation.

USSR

UDC 661:632.954

A METHOD OF PRODUCTION OF POLYFLUORO-(OR POLYFLUORONITRO)-ALKYL ESTERS OF  
4-AMINO-3,5,6-TRICHLOROPICOLINIC ACID

USSR AUTHOR'S CERTIFICATE NO. 488816, FILED 26/06/74, NO. 2033748, PUBLISHED  
14/01/76 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200400P  
by T. I. Bobrova]

FOKIN, A.V., KOLOMIYETS, A.F., KOMAROV, V.A., SHABANOV, G.N.

[Text] Compounds of the general formula  $\text{ROOCC}=\text{NCCl}=\text{CClCNH}_2=\text{CCl}$  (I) (R= polyfluoro-, polyfluoronitroalkyl), which have high biological activity, are produced by reacting 4-amino-3,5,6-trichloropicolinic acid (II) with polyfluoro-or polyfluoronitroalkanol in the presence of pyridene and  $\text{POCl}_3$  in an inert organic solvent ( $\text{CHCl}_3$ ,  $\text{CHCl}=\text{CCl}_2$ ) at a temperature of -10 to 0 C. Example. To a mixture of 24.15 g II add 15.5 g  $\alpha$ -nitrodifluoromethylethanol in 150 ml  $\text{CHCl}_3$  at -10 C add 27 g pyridene, in 2 hours add a solution of 17 g  $\text{POCl}_3$  in 50 ml  $\text{CHCl}_3$ , slowly heat to 20 C, agitate 1-2 hr at 20 C, let stand 10-12 hr, pour out onto 200-300 g ice, evaporate the organic layer, producing 33.5 g  $\alpha$ -nitrodifluoromethylethyl ester of II, m.p. 112-4 C (hexane- $\text{CHCl}_3$ , 1:1). Similarly, one can produce I (given are R, yield in %, m.p. in C):  $\text{CF}_2(\text{NO}_2)\text{CH}_2$ , 90.5, 135-6;  $\text{CHF}_2\text{CF}_2\text{CH}_2$ , 97, 139-40. I can be used in agriculture.

USSR

UDC 661:632.954

AN AQUEOUS EMULSION WITH POLYMER THICKENER

USSR AUTHOR'S CERTIFICATE NO. 475140, FILED 8/02/73, NO. 1880349, PUBLISHED  
28/10/75 in Russian

[From REFERATIVNYY ZHURNAL, KHIMIYA No. 20 (II) 1976 Abstract No. 200413P  
by T. G. Belyayeva]

SAVEL'YEV, V.Ya., STEL'MASHUK, V.A., PEN'KOV, A.I., SUKHAREV, S.S.

[Text] In order to decrease the losses of pesticide as a result of evaporation and drifting of droplets during aircraft treatment of fields, a copolymer of methacrylic acid and methacrylamide is added as a polymer thickener. The preparation contains (wt.%): active substance 0.5-6; copolymer 0.3-1; liquid glass 0.1-0.5.

USSR

UDC 632.954:633.88

DESTRUCTION OF WEEDS ON "AMMI ZUBNAYA" FIELDS USING LINURON

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 68-69

SAVENKO, B. I., Crimean Experimental Station, All Union Institute of Medicinal Plants

[Abstract] It has been shown that Linuron used at dose levels of 2-3 kg per hectare after germination of "ammi zubnaya" -- an annual grassy plant used for the production of furanochrom Kellin -- destroys 74-96% of the weeds. The harvest yield and the medicinal quality of the plants are not affected. Tables 3; no figures or references.

USSR

UDC 632.954+631.81:633.2.032

USE OF HERBICIDES AND FERTILIZERS ON NATURAL GRASS FIELDS OF THE EXTENSIVELY DRAINED RIVER VALLEYS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 66-67

NENAROKOV, M. I., and IVANOV, I. S., Pavlov's Meadow Cultivation Experimental Field of the Scientific Research Institute of Agriculture

[Abstract] Experiments carried out in 1970-1973 showed that in the chernozem steppe zone, on extensively drained river valleys, a two year treatment of natural grass fields with the 2,4-D amine salt at doses ranging from 1.5 to 2.0 kg/hectare combined with a supplement of  $N_{45}P_{45}K_{45}$  during the autumn or spring season leads to an almost total control of grass heterogeneity. Highly productive meadows are obtained with predominance of the desired grasses. In areas covered for long periods with water and on slowly draining river valleys, the herbicides should be applied in August. Tables 2; no figures or references.

USSR

UDC 632.954:635.342

USE OF RAMROD AND SEMERON OVER THE FIELDS OF EARLY WHITE CABBAGE

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 64-65

DOLOT, N. K., Sovkhoz "Bezlyndovskiy," Khar'kov Oblast'

[Abstract] It was shown that application of ramrod at a dose of 6 kg/hectare just prior to planting the seedlings of white cabbage followed by semerone

at 0.5 kg/hectare during the vegetation period, lowers the overall cost of growing early cabbage. Using TLC method, no residual semerone was found in the cabbage head; the content of ramrod was 0.06-0.1 mg/kg -- well within the acceptable levels. Table 1; references 7: 6 Russian, 1 Western.

USSR

UDC 632.954:635.655

EFFECT OF HERBICIDES ON THE HARVEST AND QUALITY OF SOYA BEAN SEEDS IN  
POLTAVE OBLAST'

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 62-64

MALYSHEV, N. YE., Poltava Agricultural Institute

[Abstract] Effectiveness of treflan, linuron and prometrin was studied on soya bean fields of the Kirovogradskaya and VNIISK-4 brands planted on chernozem soil in Poltava region (low rainfall). Treflan was found to affect all types of weeds. The use of herbicides led to larger plants. All herbicides lowered somewhat the fat and protein content of the soya bean seeds. However, improved yield of the crop made up for it, leading to an actually larger total harvest. Tables 2; references 6: all Russian.

USSR

UDC 632.95.028

DYNAMICS OF THE DECREASE OF PESTICIDE RESIDUES IN THE FRUITS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 43-44

ADEISHVILI, L. G., Georgian Scientific Research Institute of Plant Protection, KLISENKO, M. A., and PIS'MENNAYA, M. V., VNIIGINSTOKS

[Abstract] Dynamics of the disappearance of pesticide residues was studied under growing conditions predominating in Georgian SSR, using the following agents: phazolone, phtalophos, phosphamide, gardona, carbophos, anthio on the following fruits: applies, tangerines and grapes. The disappearance rate decreased with temperature lowering. The T<sub>50</sub> (time at which the pesticide decreased by 50%) changed in the following way: anthio < carbophos < phtalophos < gardona < phosphamide < phazolone. Tables 2; figure 1; references 8: 6 Russian, 2 Western.

USSR

UDC 632.95.02

EVALUATION OF THE TOXIC EFFECT OF PESTICIDE MIXTURES

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 54-55

POPOV, P. V., All Union Scientific Research Institute of Chemical Plant Protective Agents

[Abstract] A formula developed in an earlier study was used to calculate additive toxicity of a mixture of pesticides. Effect of the pesticides in a mixture has been expressed by the coefficient of concurrent activity (the ratio of the calculated value over the experimental one). If this coefficient is higher than one, the effect is synergistic. The cost effect of using various mixtures is analyzed. Table 1; no figures, references: 1 Russian.

USSR

UDC 632.95.024:582.683.2:577.158.52

EFFECT OF PESTICIDES ON THE ACTIVITY OF HORSE RADISH PEROXIDASE

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 41-42

BLAGONRAVOVA, L. N., and NILOV, G. I., Nikita Botanical Garden

[Abstract] Pesticides affect the metabolism in plants; this study picked up this problem, investigating their effect on the activity of peroxidase. The resistance of plants to various pathogens could be estimated by the degree of peroxidase activation. Following agents were found to enhance the activity of peroxidase (agent and concentration in % being reported): sevin, 0.2-0.5; suflenon, 0.3 and 0.5; keltan, 0.1-0.5; figon, 0.5; aramite, 0.3-0.5; ethersulfonate, 0.5; fozalon, 0.3; metaphos, 0.2 and 0.3. They appear to improve the protective functions of a plant. The compounds metathione, rogor, carbophos and tedion lower these protective functions. Table 1; references 14: 13 Russian, 1 Western.

USSR

UDC 632.954:502.7

PESTICIDES AND THE ENVIRONMENT: DERIVATIVES OF THE AROMATIC MONOBASIC CARBOXYLIC ACIDS (A REVIEW)

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian Vol 13, No 11, 1976 pp 38-41

KOROTKOVA, O. A., All Union Scientific Research Institute of Chemical Plant Protective Agents

[Abstract] Basic processes are reviewed of the breakdown of pesticides from the group of aromatic monobasic carboxylic acids, their derivatives and possible routes of their circulation in the environment. Some herbicides from this group are unsafe because of their persistence and ability to penetrate deeply into the soil, into the underground water and be spread by it on global level. Table 1; references 26: 1 Russian, 25 Western.

USSR

UDC 615.287.5.012.1

RESEARCH ON PYRETHRINS AND RELATED COMPOUNDS. VIII. SYNTHESIS AND INSECTICIDAL PROPERTIES OF SOME (5-ARYLFURYL-2)-METHYLCHRYSANTHEMATES

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 10, Oct 76 pp 26-28 manuscript received 12 Apr 76

VOLKOV, YU. P., ZAVEDEYEVA, I. I., ZIMOV, P. I., ZUBOVA, G. M., and OLEYNIK, A. F., All-Union Scientific Research Institute of Disinfection and Sterilization, All-Union Pharmaceutical Chemical Research Institute imeni S. Ordzhonikidze, Moscow

[Abstract] 5-Aryl-2-hydroxymethylfurans react with natural d-trans-chrysanthemic acid chloride in benzene in the presence of pyridine to give high yields of (5-arylfuryl-2)-methyl-d-trans-chrysanthemates, the substituent at position-5 in the benzene ring being H, Me, MeO, Cl, Br and NO<sub>2</sub>. The insecticidal properties of the compounds for houseflies are summarized in a table. The unsubstituted compound has the highest insecticidal action with LD<sub>50</sub> = 160 µg/g, the least lethal being the nitrite-substituted chrysanthemate with LD<sub>50</sub>=7923 µg/g. Optically inactive cis, trans analogs of these chrysanthemates were synthesized from racemic cis, trans-chrysanthemic acid and the same furan alcohols. The insecticidal properties of the resultant compounds are considerably inferior to the first. References 5: 2 Russian, 3 Western.

USSR

UDC 632.95:621.414.3

SORPTION OF PESTICIDES BY SOIL COMPONENTS (LITERATURE REVIEW)

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian No 9 1976 pp 48-57

GOLOVKIN, G. V. and VOLOVNIK, L. L., All-Union Scientific Research Institute for Chemical Means of Plant Protection

[Abstract] An analysis is presented of data from the world literature published over the past 5 to 10 years on the sorption-desorption interaction of pesticides, soils and clay minerals. Sorption primarily means adsorption in this article. The theory of sorption, the role of soil humus and secondary minerals in the sorption of pesticides in the soil, the influence of pH, as well as moisture and temperature of the air on sorption-desorption processes between pesticides and soil are briefly described. The dependence of the process on the structure of the chemical compounds involved is discussed. It is pointed out that sorption and desorption phenomena are among the most important in determining the persistence of pesticides in the environment, a very important question, since pollution can only be avoided by calculating pesticides not only for quantitative effect, but also for specific duration of action, after which time it is vital that the pesticides dissipate and break down into harmless components, in order to avoid long-term soil pollution. 75 references, almost all in English.

USSR

UDC 632.95.028:541.144.8

PHOTOLYSIS OF PESTICIDES IN THE ENVIRONMENT (AN ANALYTIC REVIEW)

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian No 9 1976 pp 57-62

KLISENKO, M. A.,

[Abstract] Literature data are presented on the photochemical decomposition of pesticides in the air, soil and on plants, produced in laboratory and field experiments. Chemical types covered include organochlorine and organophosphorus pesticides, urea derivatives, carbamates, carboxylic acid amides, phenoxyacids, amines, amidines and nitrophenols. 33 references.

USSR

UDC 632.95.025.1

CONTACT TOXICITY OF MIXTURES OF CHLOROPHOS WITH DICHLOROPHOS FOR HOUSEFLIES

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian Vol 14 No 10 Oct 76 pp 35-36

POPOV, P. V. and GALITSINA, V. V., All-Union Scientific Research Institute for Chemical Substances for Plant Protection

[Abstract] It is commonly believed that the contact toxicity of mixtures of chlorophos and dichlorophos for houseflies is greater than the simple sum of the toxicities of the two insecticides. The experiments of the authors, involving both normal and resistant populations of houseflies, demonstrated conclusively that the effect of the two insecticides when mixed together is simply additive, with neither synergism nor antagonism manifested by DDVP.

USSR

UDC 632.95.021:634.1/.7

REQUIREMENTS FOR INSECTICIDES AND ACARICIDES USED FOR INTEGRATED PROTECTION OF ORCHARDS

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian Vol 14 No 10 Oct 76 pp 46-49

SAZONOV, P. V. and TOLSTOVA, Yu. S., All-Union Scientific Research Institute for Plant Protection

[Abstract] The need to combine chemical means of protection of fruits with biological means places a number of new requirements on insecticides and acaricides, the most important of which are: selectivity of toxic effect, low persistence, moderate toxicity for useful arthropods and absence of any activating influence on the development of pests. 12 references.



USSR

UDC 632.954:[633.365+633.14]

THE EFFECT OF HERBICIDES ON LUPINE AND THE AFTEREFFECT ON WINTER RYE

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian Vol 14 No 10 Oct 76 pp 50-52

IVANTSOV, N. K. and FUKI, A. Ye., Vlikolukskiy Agricultural Institute

[Abstract] A study is made of the effect and aftereffect of linuron (1 and 1.25 kg/ha), treflan (1 and 1.5 kg/ha) and their mixtures in feed lupine in Pskov oblast. The most effective weed fighter is found to be linuron and its mixture with treflan. The herbicides had no negative effects on delivery of the primary nutrient elements to the lupine plants or the quality of the green mass produced. Linuron was effective against weeds not only in the year of application on lupine, but also during the following year when winter rye was planted. As the dose of linuron is increased, its aftereffects on weeds increase and the rise in harvest increases. The use of herbicides did not result in deterioration of the chemical composition of the winter rye or its seed qualities. Total nitrogen, phosphorus and potassium were determined in one charge, starch by the method of acid hydrolysis, protein by multiplication of the total nitrogen content by 5.70. These chemical factors in the winter rye remained practically unchanged.

USSR

UDC [577.024/.025+577.158.7]:581.12

INFLUENCE OF CATALASE ON THE ACTIVITY OF PEROXIDASE FROM THE LEAVES OF BARLEY AND PEAS TREATED WITH 2,4-D

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian Vol 14 No 10 Oct 76 pp 55-57

LADONIN, V. F. and PRONINA, N. B., All-Union Scientific Research Institute of Fertilizers and Soil Science

[Abstract] Data are presented on the influence of catalase on oxidase and diaphorase activity of peroxidase in protein preparations from the leaves of barley and peas both treated and not treated with 2,4-D. The oxidase and peroxidase functions of the enzyme were found to react differently to the presence of the catalase. The catalase influenced the rate of oxidation differently, depending on the age of the plants studied. The inhibiting effect of the catalase on the oxidation process was stronger in peas. This influence apparently results from the specific enzymatic activity of the catalase, which has been demonstrated before. It is currently considered that catalase removes hydrogen peroxide formed during the oxidase effect of the preoxidase from the sphere of the reaction. According to the results produced in this work, 2,4-D causes significant changes in the mechanism of

action of peroxidase, as was confirmed by the varying sensitivity of peroxidase systems of plants to the addition of catalase.

USSR

UDC 632.954:[633.11+633.511]

PREPARATIONS FOR CHEMICAL WEEDING OF WHEAT IN COTTON PLANTING AREAS

Moscow KHIMIYA V SEL'SKOM KHOZYAISTVE in Russian Vol 14 No 10 Oct 76 pp 57-60

GULIN, V. D., ABAYEV, R. I., KOLOMIYETS, A. F. and MIKHAYLYANTS, R. S.,  
USSR Agriculture Ministry

[Abstract] The authors studied the possibility of using esters and amides of phenoxyacids for weeding of grain crops in cotton-growing areas. Primary selection of preparations was performed by evaluation of their toxicity for weeds among the grain plants. Also, the possible degree of damage to cotton was estimated, both upon application of the preparations directly to the plants, and upon spraying of fields located among cotton fields. The preparations selected were tested in 1967-1973 on several collective farms. It was found that the most suitable preparations for chemical weeding of grains in cotton-growing areas are the benzyl esters of 2,4-D, 2,4,5-T, 2,4,5-TP and 2,4-D amide. 2,4-D benzyl ester and 2,4-D amide must be considered most promising. 13 references.

USSR

UDC 613.6:669.14

## EXPERIENCE WITH IMPROVING THE SANITARY CONDITIONS OF LABOR IN A PRODUCTION AREA WHICH USES THE LIQUID COOLANT "SUL'FOFREZOL"

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 12, Dec 76 signed to press 17 Feb 76 pp 39-40

MIKHALEVA, T. I., City Sanepidstation, Cheropovets

[Abstract] Sul'fofrezol is used in the fastening shop of a Cheropovets steel rolling mill as a cooling liquid in the preparation of bolts and nuts; it pollutes the production area with an oily aerosol. Temperature in the area reaches 200-230°, and the aerosol exceeds permissible levels of contamination. The sanitary service of the plant demanded substitution of the sul'fofrezol by a cooling emulsion, described as EI-2, EGI, or I. An emulsion consisted of emulsol (EI-2), 200 g/l, trisodiumphosphate, 4.5 g/l, and sodium nitrate 2.5 g/l. The plant made it possible to switch to emulsion cooling by preparation of phosphated gage metal. Ventilation of the press area was simultaneously improved. Quality of product improved, as did profits, as a result of the combined sanitary improvement of labor conditions for the press workers. No references.

USSR

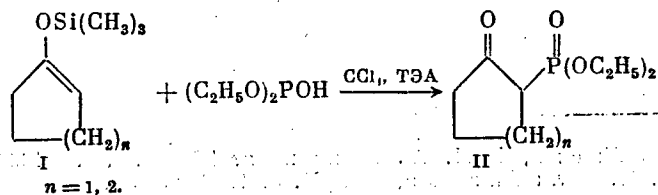
UDC 547.245

## REACTIONS OF O-TRIETHYLSILYL VINYL ETHERS WITH DIETHYLPHOSPHITE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 46, No 9, Sep 76 signed to press 13 Feb 76 pp 2154-2155

LAZUKINA, L. A., KUKHAR', V. P., and PESOTSKAYA, G. V., Institute of Organic Chemistry, Academy of Sciences UkrSSR

[Abstract] The authors found that silylvinyl ethers react with diethylphosphite under Todd-Atterton reaction conditions--boiling in a solution of CCl<sub>4</sub> in the presence of triethylamine.



Compound II is identical with a substance earlier produced by them, a product of C-phosphorylation--infrared spectra show intense absorption at 1680-1730  $\text{cm}^{-1}$  ( $\text{C}=\text{O}$ ); PMR spectra show absence of signals characteristic of protons of the CH group with a double bond. Small yields of II (not over 35%), and difficulty of separation in pure form indicate that the reaction is accompanied by formation of O-phosphorylation products. The ethyl ether of 3-trimethylsiloxycrotonic acid reacts with diethylphosphite to form, quantitatively, the O-phosphorylation product. The PMR spectrum of the latter clearly shows the signal of a proton of CH group with the double bond in the 5.5 m.d. region. A synthesis of this latter compound, diethylether of ( $\alpha$ -methyl- $\beta$ -carboethoxyvinyl)-phosphoric acid, is given by the authors. References 3: all Russian.

USSR

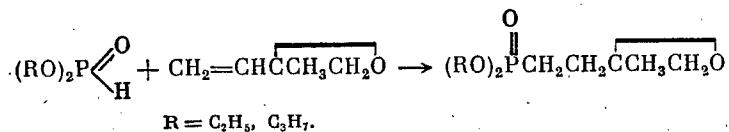
UDC 547.371-542.26'118

#### RADICAL-ADDITION OF DIALKYLPHOSPHITES TO ISOPRENE MONOXIDE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 46, No 9, Sep 76 signed to press 4 Feb 76 p 2153

AL'BITSKAYA, V. M., ZAVLIN, P. M., RAZINA, R. S., and KHOKHLATOVA, L. YU., Leningrad Institute of Motion Picture Engineers

[Abstract] Al'bitskaya, et al., showed earlier (1969) that thiols and selenols add, radically, to isoprene monoxide mostly in the 1,4-position. They have found that addition of dialkylphosphites to isoprene monoxide, under UV radiation, involves selective attachment only at the double bond of the monoxide with formation of epoxybutanephosphonates.



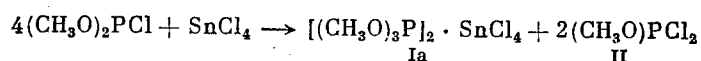
Several epoxybutanephosphonates are listed which have been produced under illumination with UV light (PRK-4 lamp) in quartz tubes in an argon atmosphere, at room temperature, for 70-80 hr with the oxide/dialkylphosphite ratio = 1:1. References 2: both Russian.

## REACTION OF DIMETHYLCHLOROPHOSPHITE WITH STANNIC CHLORIDE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 42, No 9, Sep 76 signed to press 8 Jan 76 pp 2152-2153

PUDOVIK, A. N., MURATOVA, A. A., SOBANOVA, O. B., YARKOVA, E. G., and KHRAMOV, A. S., Kazan State University imeni V. I. Ul'yanov-Lenin

[Abstract] Pudovik noted (1968) the ready isomerization of trimethyl phosphite during its complex formation with stannic chloride, and has studied the analogous reaction with dimethylchlorophosphite, the nucleophilic character of which is lower. In a 4:1 ratio of the initial reactants in anhydrous pentane at  $-15-0^{\circ}$ , a white crystalline substance (Ia) formed which was completely precipitated in 3 days. Methylidichlorophosphite was also present.



These products form, apparently, as a consequence of disproportionation of the dimethylchlorophosphite which is substantially accelerated in the presence of the stannic chloride. Physical and chemical properties are discussed. References 3: 1 Russian, 2 Western.

## TWENTY YEARS OF THE ACTIVITY OF THE SECTION ON ESTABLISHMENT OF MAXIMUM PERMISSIBLE CONCENTRATIONS OF HARMFUL SUBSTANCES IN THE AIR OF WORK AREAS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA in Russian No 12, Dec 76 signed to press 29 Jun 76 pp 33-34

SANOTSKIY, I. V., and SIDOROV, K. K., Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences USSR

[Abstract] The title Section was created in 1956. It has been headed since 1972 by Sanotskiy. Its tasks are: development of basic directions of subjects and coordination of research in the USSR on establishment of MPL of new--and review of previously established--MPL of harmful substances and their submission for approval of the Ministry of Health USSR; survey and approbation of corresponding procedural guides, letters, instruments, and methods of study; preparation, for the Ministry of Health USSR, of projected departmental and governmental decrees; hearings of informational reports of establishments working in the field of hygienic standardization of occupational poisons in the air of work areas. The Section recommended

MPLs for 515 substances from 1963-1975. It has been concerned with the following basic and theoretical questions: i) structural basis of biological activity of substances; ii) laws of absorption of poisons by the body, their dissemination, conversion, and excretion; iii) laws and causes of change in sensitivity to poisons during phylo- and ontogenesis; iv) limits of physiological adaptation and temporary compensation of pathological processes; v) causes of appearance of immediate and delayed sequelae of the effects of substances: general morbidity, especially cardiovascular, blastomogenesis, damage of function of reproduction of young; vi) criteria of toxicity; and, vii) mathematical modeling of processes of intoxication. The Section participated in preparation of standards and informational meetings on MPL around the country. As chemical industry grows and chemical technology is introduced into other branches of the national economy, the Section will have to advance its scientifically-based evaluation of toxicity and establishment of hygienic standards. No references.

USSR

UDC 612.017.1.014-46:615.285.7.025.1

IMMUNOLOGICAL STATUS OF THE BODY UNDER THE PERORAL INFLUENCE OF THE GAMMA ISOMER OF HEXACHLOROCYCLOHEXANE

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press  
3 Mar 76 pp 14-18

GURBACHEVSKAYA, YE. F., All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers, and Plastics, Kiev

[Abstract] The author has examined the autoimmune process, i.e., humoral and cellular factors of immunity, and has analyzed the antigenic properties of autotissues, in particular of the liver, in view of the known action on it of chloroorganic compounds. Test animals used were adult chinchilla rabbits. (Intoxicating doses of gamma HCCH were based on a toxicology handbook: "Spravochnik po pestitsidam." Kiev, Urozhay, 1972). The observed increase in level of fetal hemoglobin, accumulation of quantities of erythrocytes, and intensified formation and entry into the blood of anti-erythrocytic autoantibodies, indicate that this "triad" or individual components of it, appear in the latent period of intoxication and thus can serve as one of the early indications of bodily changes which demand prophylactic measures to prevent development of the chemically-induced pathology. Figures 5; references 13: all Russian.

USSR

UDC 577.153.4:612.8.015

INHIBITION OF CHOLINESTERASE ACTIVITY IN RATS BRAIN BY ORGANOPHOSPHORIC  
INHIBITORS WITH DIFFERENT DEGREE OF HYDROPHOBITY

Kiev UKRAYINS'KYY BIOKHIMICHNYY ZHURNAL in Russian Vol 48, No 4, Jul/Aug 76  
pp 450-454 manuscript received 3 Mar 75

MASLOVA, M. N., and REZNIK, L. V., Institute of Evolution Physiology  
and Biochemistry, Academy of Sciences USSR, Leningrad

[Abstract] The effect of two organophosphorus inhibitors of cholinesterase (OPI) -- GA-89 and GA-95 -- both from a group of O-alkyl-S-hexylthiophosphonates, on the activity of the enzyme in different areas of the rat's brain was studied. These agents differ considerably in the degree of their hydrophobity, that of GA-95 being larger by two orders of magnitude than that of GA-89. Upon administration of GA-89 the degree of enzyme inhibition in the brain surpassed that in circulating blood. However, when GA-95 was administered, the opposite effect was observed. When both agents were administered, highest depression was noted in the brain cortex. The distribution in different brain areas evidently does not depend on the hydrophobity. Tables 2; references 14: 6 Russian, 8 Western.

USSR

UDC 577.3:577.15

CHARACTERISTICS OF THE BINDINGS OF ORGANOPHOSPHORIC INHIBITORS OF  
CHOLINESTERASE IN THE RAT BRAIN TISSUE

Kiev UKRAYINS'KYY BIOKHIMICHNYY ZHURNAL in Russian Vol 48, No 4, Jul/Aug 76  
pp 460-464 manuscript received 10 Mar 75

BALASHOVA, YE. K., PEVZNER, D. L., ROZENGART, V. I., SHERSTOBITOV, O. YE.,  
and ABDUVAKHABOV, A. A., Institute of Evolution Physiology and Biochemistry  
imeni I. M. Sechenov, Academy of Sciences USSR, Leningrad and Department of  
Bioorganic Chemistry, Academy of Sciences UzbekSSR, Tashkent

[Abstract] A study was carried out on the hydrophobity (distribution coefficient in the system hexane-water) and brain tissue content of the organophosphoric inhibitor (OPI) of the cholinesterase with the formula  $RO(CH_3)P(O)SC_2H_4SC_2H_5$ . With increased O-alkyl radical, the hydrophobity increases and the relative content of free OPI in the brain, extracted by chloroform, decreases. When R is increased from ethyl to butyl, the ability to further inhibit the cholinesterase in brain is lowered. This is taken as evidence for an essential drop of the free OPI fraction relative to the free OPI extracted with chloroform. Figures 2; tables 2; references 8: 7 Russian, 1 Western.

USSR

UDC 547.962 + 547.993

ISOLATION, PROPERTIES AND AMINOACID SEQUENCE OF TWO CYTOTOXINS FROM THE  
VENOM OF MIDDLE ASIAN COBRA NAJA NAJA OXIANA

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 2, No 8, Aug 76 pp 1018-1034  
manuscript received 26 Feb 76

GRISHIN, YE. V., SUKHIKH, A. P., ADAMOVICH, T. B., and OVCHINNIKOV, YU. A.,  
Institute of Bioorganic Chemistry imeni M. M. Shemyakin, Academy of Sciences  
USSR, Moscow

[Abstract] Two cytotoxins were isolated from the venom of Middle Asian cobra *Naja Naja oxiana*. These cytotoxins exert hemolytic, cardiotoxic and cytotoxic effects. Gel-electrophoresis and N-terminal analysis were used to test for homogeneity of these cytotoxins. Aminoacid composition and total aminoacid sequence of cytotoxins were determined, showing to contain 60 aminoacid residues and 4 intramolecular disulfide bonds. The structure of two polypeptides obtained by hydrolysis of these cytotoxins with trypsin, chemotrypsin and bromocyanogen was determined by the method of Edman and by means of carboxy and aminopeptidases. Figures 11; tables 8; references 27: 3 Russian, 24 Western.

USSR

UDC 611.441:546.791:616-073.916

IODINE METABOLISM IN URANIUM POISONING ACCORDING TO WHOLE BODY RADIOMETRY  
AND ACTIVATION ANALYSIS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 39, No 6, Nov/Dec 76  
pp 722-725 manuscript received 18 Dec 75

MALENCHENKO, A. F., SEREGIN, V. V., KUZ'MINA, T. S., and YAROSHEVICH,  
A. A., Institute of Nuclear Energy, Academy of Sciences Belorussian SSR  
Minsk

[Abstract] Experiments on rats showed that in chronic uranium poisoning the value of the intrathyroid iodine pool changed and the time-dependent radioiodine recirculation relationship between the thyroid and the organism was upset. The process of the thyroid adaptation is a complex one; the hormonal capacity of the organism is kept up through an increase in the mass of the thyroid as well as by a higher rate of iodine exchange. Tables 2; figure 1; references 11: 7 Russian, 4 Western.



USSR

UDC 615.217.3

SELECTIVE PHARMACOLOGICAL EFFECT ON THE CHOLINERGIC MECHANISMS OF NERVE  
REGULATION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 9, 1976 pp 19-24

GOLIKOV, S. N., Leningrad

[Abstract] A review of the studies carried out by the author and his co-workers in the field of pharmacology of the cholinergic transmission during the last decade. The main criteria of the selective physiological activity of cholinesterase- and cholinolytic preparations in evaluation of their peripheral and central effects are given. Some aspects of clinical application of the cholinolytic preparations are considered. Along with their selective action, some other physiological effect of the compounds are discussed, such as the presynaptic effects of these agents. No tables or figures; references 10: all Russian.

USSR

UDC 616.981.553-092.9-07:612.822.2

CHANGE IN THE METABOLISM OF BIOGENIC AMINES IN BOTULINIC INTOXICATION

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 22, No 4, Jul/Aug 76  
pp 497-502 manuscript received 11 May 75

CHESNOKOVA, N. P., Chair of Pathological Physiology, Saratov Medical  
Institute, Saratov

[Abstract] An increase in the content of serotonin, histamine, elevated histamine activity in tissue and an increase in secretion of 5-hydroxyindolylacetic acid in urine were observed in experimental botulism accompanied by paresis of skeletal muscle. As the paralysis progressed, the content of histamine gradually decreased in the nerve tissue but remained at an increased level in the internal tissues. At the same time the content of serotonin was maintained at an increased level in the nerve tissue, but brought down to normal in other internal organs. Excretion of 5-hydroxyindolylacetic acid in urine was decreased. The LD<sub>50</sub> of botulinic toxin was titrated in mice, which were simultaneously administered preparations responsible for the increase or decrease of the synthesis and activity of biogenic amines. The data obtained suggest that the impairment of the metabolism of biogenic amines may be important in development of the intoxication. Figures 2; tables 4; references 13: 8 Russian, 5 Western.

USSR

UDC 612.46.015.1+616.61-008.64-092.9-008.931:577.152.412

ISOZYME SPECTRA OF FRUCTOSE-1,6-DIPHOSPHATE ALDOLASE AND KETOSE-1-PHOSPHATE ALDOLASE FROM KIDNEY UNDER NORMAL STATE AND IN URANYL ACETATE POISONING

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 22, No 4, Jul/Aug 76  
pp 478-481 manuscript received 30 Jan 75

KHOMENKO, L. A., and PETRUN', N. M., Laboratory of Biochemistry, Kiev  
Scientific Research Institute of Urology

[Abstract] Activities of both aldolases were distinctly decreased in acute kidney insufficiency caused by administration of uranyl acetate. The decrease in the activity of fructose-1,6-diphosphate aldolase was more pronounced, leading to an alteration in the ratio of fructose-1,6-diphosphate to ketose-1-phosphate aldolases. The isozyme spectra of the enzymes were also altered. Isozymes of fructose-1,6-diphosphate aldolase AB<sub>2</sub> and of ketose-1-phosphate aldolase from II showed the same electrophoretic mobility; their relative activity was increased 2-3-fold under conditions of acute kidney insufficiency. At the same time, the more electrophoretically mobile isozymes were not detected. Table 1; references 17: 11 Russian, 6 Western.

USSR

UDC 615.919:598.126].015.42:612.015.348

EFFECT OF THE VENOM OF NAJA NAJA OXIANA ON THE BIOSYNTHESIS OF NUCLEIC ACIDS AND PROTEIN IN ANIMAL CELLS

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 22, No 4, Jul/Aug 76  
pp 462-465 manuscript received 20 Mar 75

TURAKULOV, YA. KH., KHALIKOV, S. K., RAKHIMOV, M., and SOROKIN, V. M.,  
Institute of Biochemistry, Academy of Sciences UzbekSSR, Tashkent

[Abstract] Cobra venom at a dose of 4 ug/kg body weight intensified the <sup>3</sup>H-thymidine incorporation into DNA of mice liver tissue; a dose of 20-40 ug/kg inhibited the incorporation. Single intraperitoneal administration of high doses of this venom (50-150 ug/kg) decreased the incorporation of <sup>14</sup>C-thymidine into DNA by 1.2-1.9 fold. Small doses of the venom increased the incorporation of <sup>14</sup>C-hydrolysate of Chlorella protein into the protein of liver cells and the high doses inhibited this process. Microdoses of cobra venom caused a distinct increase in the body weight of experimental animals. Tables 4; references 9: 4 Russian, 5 Western.

USSR

UDC 612.745.6+612.766.1].014.46:[615.214.31+615.31:547.473.2  
+615.31:547.583.5

CHARACTERISTICS OF THE EFFECT OF SODIUM HYDROXYBUTYRATE, PHENAMINE,  
TRANSAMINE, L-DOPA ON PHYSICAL PERFORMANCE CAPACITY OF ANIMALS UNDER  
REPEATED WORKLOADS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 39, No 6, Nov/Dec 76  
pp 656-658 manuscript received 20 Jul 75

KUROCHKIN, I. G., and TSIKALOVA, T. S., Laboratory of the Pharmacotherapy  
of Experimental States, Division of Pharmacology, Institute of Pharmacology,  
Academy of Medicinal Sciences USSR, Moscow

[Abstract] Under conditions of developed fatigue, sodium hydroxybutyrate (100 mg/kg) in combination with transamine (0.5 mg/kg) leads to an accelerated restoration of physical work capability of rats. On the background of an effect of phenamine (1 mg/kg) and transamine (1 mg/kg) the initial increase of work capability is accompanied by a sharp depletion of the restoration processes at later work loads. A combination of L-DOPA (50 mg/kg) and sodium hydroxybutyrate (100 mg/kg) leads to a prolonged increase of the performance capability of animals even under conditions of repeated workloads. Figures 3; references 6: 3 Russian, 3 Western.

USSR

UDC 621.039.54

## PHYSICAL AND CHEMICAL FUNDAMENTALS FOR PREPARING GRANULAR CERAMIC FUELS

Leningrad RADIOKHIMIYA in Russian No 5, 1976 pp 773-783

MAKAROV, V. M., SKOTNIKOV, A. S., ZHIBOYEDOV, V. G., YAROSHINSKIY, V. I., and SEMENOV, B. A.

[Abstract] During the last ten years, there has been a strong development of the "classical" sol-gel-process as applied to the production of ceramic nuclear fuels. This article describes the technological procedures for this process together with methods for internal gelation and gel-supported precipitation. Methods are considered for preparing concentrated acidic, oxygen-free, colloidal solutions of thorium and plutonium salts. Studies of liquid-vapor equilibria in the system  $\text{HNO}_3\text{-Pu}(\text{NO}_3)_4\text{-H}_2\text{O}$  indicate that changes in the "salting-out" effect of the  $\text{Pu}(\text{NO}_3)_4$  may be explained by a subsequent change in the hydration shells and the formation of the  $\text{Pu}(\text{NO}_3)_6^{2-}$  complex ( $K \approx 10^{-6}$ ). Calculated data are presented on the relationship of the efficiency of vibrating capillaries used to make the uniform-sized drops during the gelation process. Washing off of the gel-spheres from the salt obeys the law of gel kinetics. An exponential equation is developed which describes the washing of gel-spheres under dynamic conditions. The diffusion coefficients of the nitrate ions in the gels equal  $1.8 \times 10^{-6}$  and  $4.3 \times 10^{-6} \text{ cm}^2/\text{sec}$  at 20 and  $60^\circ\text{C}$  respectively. Photographs are shown of both high-quality and defective spheres. Table 1; figures 8; references 19: 9 Western, 10 Russian.

USSR

UDC 621.039.59:546.15

## DETERMINING THE CONCENTRATIONS OF IODINE-129 IN THE TECHNOLOGICAL SOLUTIONS USED FOR THE REPROCESSING OF FUEL CELLS FROM WATER-MODERATED NUCLEAR PLANTS

Leningrad RADIOKHIMIYA in Russian NO 5, 1976 pp 790-793

RAGIMOV, T. K., MAKAROV, V. M., YAROSHINSKIY, V. I., TIMOSHIN, V. I., RAU, D. F., AMOSOVA, M. A., and LUNICHKINA, K. P.

[Abstract] Methods are described for separating and purifying  $\text{I}^{129}$  from the title solutions. Various oxidation-reduction systems were used in order to decrease the number of iodine species;  $\text{I}^-$  and  $\text{IO}_3^-$  are the most common but  $\text{HIO}$ ,  $\text{HIO}_2$ ,  $\text{I}_2$ ,  $\text{ICN}$ ,  $\text{INO}$  and others are also present. The best results were obtained using hydrolysis in a basic solution (free base, about 1M) in the presence of "cold" iodine as a carrier. Neutron

activation analysis was used to assay the experimental solutions. Approximately 90% of the original  $I^{129}$  was recovered; the remaining 10% was distributed as follows: 0.2%, washing solutions; 0.5%, alkaline carbonate solution; 4.5% in the reverse extractant; and 5.5% in the reprocessed fuel cell. The following nuclides do not interfere when present in less than the stated amount, in microcuries/g  $I^{129}$ ,  $Cs^{137}$ , 20;  $I^{131}$ , 50;  $Ce^{144}+Pr^{144}$ , 10;  $Ru^{106}+Rh^{106}$ , 1000; and  $Zr^{95}+Nb^{95}$ , 200. References 7: 4 Western, 3 Russian.

USSR

UDC 621.039.59

TECHNOLOGICAL METHODS FOR THE COMBINED RECOVERY OF SPENT FUEL ELEMENTS FROM THERMAL NEUTRON ATOMIC REACTORS

Leningrad RADIOKHIMIYA in Russian No 5, 1976 pp 784-789

SHEVCHENKO, V. B., SMELOV, V. S., KOZLOV, A. G., SMETANIN, E. YA., CHUBUKOV, V. V., and ANISIMOV, V. I.

[Abstract] Results are presented for using a two-cycle extraction process to recover the uranium from a water-moderated nuclear-plant fuel cell after it had cooled 14 months. The general schematic is as follows: dissolution of the fuel in nitric acid; simultaneous extraction of U, Pu and Np with tributyl phosphate; reduction with hydrazine and re-extraction of Pu and Np and their selective elution; re-extraction of U; the regeneration of the extractant and beginning of the second cycle. The purification coefficients of U from other  $\gamma$ -radiating products and from Pu were equal to  $1.4 \times 10^7$  and  $5.5 \times 10^5$ . The losses of U, Pu and Np with the washing solutions were 0.007, 0.024, and 3.4% respectively of the initial amount. An analogous extraction process is discussed for separating Sr, Am, Cm and the rare earth elements. A recovery of 92-95% of each of the four is effected. Figures 2; tables 2; references 11: 2 Western, 9 Russian.

USSR

UDC 542.61:(546.799.4+546.791)

EXTRACTION OF PLUTONIUM AND URANIUM USING TERTIARY ALIPHATIC PHOSPHENOXIDES

Leningrad RADIOKHIMIYA in Russian No 5, 1976 pp 737-765

LASKORIN, B. N., SKOROVAROV, D. I., FILIPPOV, YE. A., and VOLODIN, I. I.

[Abstract] The structure of the substituting radicals in symmetrical and unsymmetrical molecules of tertiary aliphatic phosphenoxides (TAPO) was

shown to exert a significant effect on the extraction characteristics and on the solubility of the TAPO-extracted-metal complexes. The effect of the solvent (aliphatic or chlorinated hydrocarbons) is also considered. Solubility values are given for around 40 complexes of TAPO with plutonium (IV) and uranium (VI). In general the solubility increased with the size of the alkyl groups from  $5.6 \times 10^{-4}M$  for  $C_4H_9$  to  $>5,000 \times 10^{-4}$  for  $C_{16}H_{33}$ .

The uranium complexes were generally more soluble than those of the plutonium. The effects of other parameters of the system -- such as the concentrations of the phosphenoxides and nitric acid, and saturation -- on the solubilities were discussed. Methods are discussed for growing crystals of the complexes and pictures of such crystals are shown. Several crystalline properties -- melting points and diffraction spectra -- plus IR spectra and curves similar to DTA were determined. Finally these complexes were used in a process for the purification and concentration of plutonium and uranium from spent atomic fuel from fast neutron reactors based on the extraction of the metals out of a nitric acid solution in the system nitric oxide-TAPO-re-extraction solution. Tables 4; figures 23; references 11: 3 Western, 8 Russian.

USSR

UDC 621.039.59:542.61

#### THE APPLICATION OF EXTRACTION TECHNOLOGY TO THE REGENERATION OF NUCLEAR POWER PLANT FUELS

Leningrad RADIOKHIMIYA in Russian No 5, 1976 pp 766-772

GALKIN, B. YA., ZEMLYANUKHIN, V. I., KONDRAT'YEV, A. N., LAZAREV, L. N., LUSBTSEV, R. I., PUSHLENKOV, M. F., and ROMANOVSKY, V. N.

[Abstract] Predictions are made for the world-wide development of atomic energy through the year 2000. As the output of atomic energy is projected to increase by more than an order of magnitude and that for each megawatt of plant capacity, 30-35 tons/year of spent fuel will be generated, the methods for handling the spent fuel must be improved. The current technological procedures, based on the extraction of the metals in their higher valence state out of an acidic aqueous solution with an organic phase, are outlined and possible areas for improvements are mentioned. Strong emphasis is placed on engineering solutions and on the development of certain forms of technological instrumentation. An outline is also presented of the technological process based on the application of heavy non-combustible solvents, such as carbon tetrachloride. Data are presented from an actual experimental pilot project using this method for the processing of spent fuel from the Novo-Voronezhsky Nuclear Power Plant. Table 1; references 29: 14 Western, 15 Russian.

USSR

UDC 614.777:628.394

JUSTIFICATION OF CONDITIONS OF EFFLUENT DISCHARGE FROM CERTAIN INDUSTRIAL ENTERPRISES INTO RESERVOIRS OF THE AZERBAIDZHAN SSR

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press  
18 Jul 75 pp 107-108

AKHUNDOV, K. F., doctor of medical sciences, and MAMEDOVA, A. P., Azerbaydzhani Scientific Research Institute of Virology, Microbiology, and Hygiene imeni G. M. Musabekov, Baku

[Abstract] Azerbaydzhani is extensively industrialized with environment-polluting factories: various petroleum industries, synthetic rubber, and mining combines. The republic is in a disadvantageous position in the Caucasus in maintaining fresh water, and it receives industrial and fecal sewage from Armenia and Georgia. In the Kirovabad and Dashkesan regions the surface waters are shallow and it is difficult to dilute them. Necessary, therefore, is maximal use of purified industrial sewage for reverse supply of enterprises; use of industrial effluent for agricultural irrigation will render it harmless and protect reservoirs from contamination; the remaining quantities of industrial sewage must be disinfected before discharge into reservoirs; setting ponds must be created for controlling release of sewage at different times of the year.

USSR

UDC 614.777.551.491:628.394.4

SELF PURIFICATION OF GROUND WATERS

Moscow GIGIYENA I SANITARIYA in Russian No 10, Oct 76 signed to press  
30 Dec 75 p 106

KOKINA, A. G., candidate of medical sciences, and GEL'FER, YE. A., candidate of medical sciences, Belorussian Scientific-Research Sanitary-Hygienic Institute, Minsk

[Abstract] Attention of the authors to the mechanics of self purification of water was stirred by the occurrence of an incidence of contamination of underground water by business and domestic sewage. A study of the chemical constituents of waters (in the quaternary deposits in the area of a filtration field of a large, unnamed, city) showed that content of nitrates and sulfates in the water at first decreased as the water proceeded away from the field, but then increased up to a point, and again decreased. They attribute this increase to biochemical, oxidation, by microorganisms, of organic substances. They noted a rise in the number of microorganisms in the water contaminated by the business and domestic sewage, and in other

instances of contamination, when there was presence in water of anthropogenic and natural (humus) organic material. They suggest an association between the number of bacteria in water and the process of self-purification by water of organic material brought into it.

USSR

UDC 628.165.048

#### REGULATION OF THE CONTENT OF DISTILLATE-BASED DRINKING WATER

Moscow VODOSNABZHENIYE I SANITARNAYA TEKHNIKA in Russian No 12, 1976 pp 9-10

YEGOROV, A. I., Doctor of Technical Sciences; IPATOV, P. F., Candidate of Chemical Sciences, and MOROZOVA, I. S., Candidate of Technical Sciences; all of the All-Union Scientific-Research Institute of Water Supply, Canalization, Hydrotechnical Construction and Engineering Hydrogeology

[Abstract] In some districts of the USSR, drinking water is prepared from a distillate obtained from industrial-type evaporators of sea water. The content of such water is controlled by the addition of mineralized artesian water. The limiting factor of subsurface water deficiency, however, may make it necessary to employ, as a saline additive, some quantity of previously purified sea water. Water stations for this purpose, employing a new technology, have been set up; here, mixture of the distillate with sea water in the proportion of 43:1 produces a salt-containing drinking water on the level of tap water supplied in the city of Moscow. However, the variable quality of the sea water from place to place in the USSR makes it necessary in every instance to check the technological and sanitation-hygiene conditions which are present in the production of such mixed water.

USSR

UDC 622.793.5

#### INSTRUMENTS FOR DETERMINATION OF SEWAGE PARAMETERS

Moscow PRIBORY I SISTEMY UPRAVLENIYA in Russian No 6, 1976 pp 54-56

AMANNAZAROV, A., candidate of technical sciences

[Abstract] In January of 1976, a thematic exhibit on "Purification of Sewage and Gaseous Air Pollution" was opened at the exhibition of the Achievements of the National Economy of the USSR in Moscow in the Chemical Industry Pavilion. The exhibit includes an automatic control system for a reservoir



complex developed under the leadership of the All-Union Scientific Research Institute for Conservation of Water, designed not only for control, but also for automation of collection and processing of information concerning the condition and quality of water in reservoirs. Several instruments for determination of water quality in river water are also listed, including the AKVA-L and the EG-152-003. The AKVA-L is a semiautomatic laboratory instrument for determination of the content of dissolved oxygen in the 0-30 mg/l range. The EG-152-003 is an automatic stationary continuous recording and indicating instrument for measurement of the content of oxygen dissolved in sewage in the process of its biochemical purification at industrial and city sewage treatment plants. Another instrument, the KV-101 measures the conductivity of surface and sewage water at depths of up to 10 m. The T-106 complex is designed for determination of the concentration of various components in solutions by fixed-end-point titration and automatic photometric fixation of the end point of titration at the extreme of the titration curve by means of a search unit. The FEM-8 instrument measures the concentration of suspended substances in well water. The MS-pH-6 instrument is a multipoint pH signalling unit; the FM-U1 is a fluorine ion meter based on the potentiometric method of measurement. Figure 1 (picture of AKVA-L)

USSR

UDC 629.337

# USE OF THE ELECTROHYDRAULIC EFFECT FOR DECONTAMINATION OF BIOCHEMICALLY PURIFIED WASTE WATERS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL (Chemical-Pharmaceutical Journal) in Russian Vol 10, No 7, Jul 76 pp 99-101 manuscript received 27 Jul 75

VYGLAZOVA, YE. G., DOL'NIKOV, A. E., and CHERNYSH, G. P., All-Union Scientific Research Institute of Vitamins, Belgorod Division

[Abstract] Bactericidal action of electric spark discharge in water (the so called electrohydraulic effect) has been studied on the microorganisms of the active sediment in purified waste waters. A relationship has been discovered between the survival of microorganisms and the number of discharge impulses of a given energy: it is an exponential curve with  $N = N_0 \exp(-0.056 \pm 0.016)n$ , where  $N$  - concentration of the microorganism cells after the action of  $n$  impulses of the discharge;  $N_0$  = initial concentration. Table 1; figure 1; references 7: 6 Russian, 1 Western.

USSR

UDC 628.165.067:615.1

RATIONAL CONSUMPTION OF WATER IN OPERATING ION EXCHANGE FILTERS OF  
DESALINATION PLANTS

Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 10, No 7, Jul 76  
pp 129-132 manuscript received 22 Sep 75

LAPKINA, YU. I., SKORIK, V. M., and SHOSTENKO, YU. V., Khar'kov Scientific  
Chemical-Pharmaceutical Research Institute, L'vov Chemical-Pharmaceutical  
Plant

[Abstract] On the basis of chemical analysis of samples collected during  
the unpacking, regeneration and washing of ion exchange filters, procedures  
have been proposed for saving water consumption during the operation of  
desalination plants. This can be achieved by recycling the water used  
during the unpacking for filtration at a later stage in the process, and  
the use of wash water from anion resin filter after its pH drops below  
8.0; effective use of a decarbonizer will save additional water consumption.  
Tables 2; references 5: all Russian.

## East Europe

### EAST GERMANY

#### IN VITRO STUDIES ON THE PERCUTANEOUS RESORPTION OF SYSTEMIC INSECTICIDAL ORGANOPHOSPHORUS COMPOUNDS

East Berlin DIE PHARMAZIE in German Vol 31 No 6, Jun 76 pp 402-404 manuscript received 12 May 75

WENZEL, K., Dr., and DEDEK, W., Ph. D., Research Station for Chemical Toxicology, Leipzig, of the Academy of Sciences of the German Democratic Republic

[Abstract] Trichlorphon, dimethoate, butonate, and imidian were  $^{32}\text{P}$ - or  $^{14}\text{C}$ -labeled and examined for percutaneous resorption in vitro, using excised cattle skin. The effect of solvent (glycerol, dimethylsulfoxide, ethylene glycol, methyl alcohol, ethyl alcohol, acetone, methylene chloride, chloroform, benzene, toluene, carbon tetrachloride, n-hexane, and n-heptane) was significant, and depended primarily on whether it is highly or slightly polar. The penetrating ability increased with increasing distribution coefficient. There was a linear relationship between the amount resorbed and the exposure duration, especially if the concentration of the test substance was low. Then, the curve was one conforming to the Fickslaw. With increasing concentration, an increase in exposure duration gave increasing resorption values, according to an exponential relationship. From the relationships found it is possible to develop an optimally acting formulation for use on cattle against larval infection. Surface-active agents and dimethylsulfoxide affect the effectiveness significantly, both in the direction of increased resorption. Figures 3; tables 2; references 14: 6 German and 8 Western.

### EAST GERMANY

#### THEORETICAL ASPECTS OF THE DETERMINATION OF THE PARAMETERS OF THE EFFECTS OF BIOLOGICALLY ACTIVE COMPOUNDS

East Berlin DIE PHARMAZIE in German Vol 31 No 6, Jun 76 pp 396-401 manuscript received 24 May 75

BARTH, A., professor, Dr., FRANKE, R., Dr., and BOERNERT, D., Dr., Martin Luther University in Halle-Wittenberg, Biosciences Section, Area: Biochemistry, Sub-Area: Biochemistry of Active Substances

[Abstract] A model of the active substance - receptor interaction was developed. It may be used under chronobiological and steady-state conditions, including

for temporally variable parameters. The parameters include dose-effect relationship, biorhythmic effects, structure-effect relationships, and various activity-effect functions. The model may be expanded to cover dynamic receptor processes also. In order to derive this model, and any expanded versions of it, one must be able to define and quantify the biological effect. The effect in one functional respect must be related to the concentration of at least one active-material - receptor complex. Thus, it becomes a dynamic value and identical to the quantitative expression of the change of a biological parameter in time. Thus, the effect is basically a velocity-like factor. The method described permits the estimation of the biological effect from primary data which are determined under steady-state conditions. Figures 7; table 1; references 12: 8 German, 1 Japanese, and 3 Western.

#### EAST GERMANY

#### PREPARATION AND PROPERTIES OF BIS- $\alpha$ -L-ARABINOFURANOSIDES OF CYTOTOXIC PHENOLS

East Berlin DIE PHARMAZIE in German Vol 31 No 5, May 76 pp 287-290 manuscript received 26 May 75

ARNDT, D., Dr., GRAFFI, A., professor, Dr., and TEPPKE, A. D., Central Institute for Cancer Research at the Academy of Sciences of the German Democratic Republic, Berlin-Buch

[Abstract] 4-[N,N-bis-(2-chloroethyl)-amino]-pyrocatechol-bis[2,3,5-tsi-0-benzoyl- $\alpha$ -L-arabinofuranoside] and 4-[N,N-bis-(2-chloroethyl)-amino]-pyrocatechol-bis-[ $\alpha$ -L-arabinofuranoside] were synthesized, starting with the corresponding nitro compounds, with the aim of detoxifying N-lewisite derivatives. The products are cleaved by  $\alpha$ -L-arabinofuranosidase in a pH-dependent manner. They differed in the rate of the hydrolytic liberation of chloride ions from the N-lewisite group. Nuclear magnetic resonance spectroscopy was used to elucidate the structures. The two compounds also differed in the extent of their biological effectiveness. The use of the latter product in combination with  $\alpha$ -L-arabinofuranosidase increased the hydrolysis of the N-lewisite group and the synthesis of DNA. This combination was tested in mice and showed a reduction of metastasis (better than the furanoside alone). The methods of synthesis and testing, and the properties of the products are presented. Figures 2; table 1; references 8: 4 German and 4 Western.

EAST GERMANY

STRUCTURE-EFFECT RELATIONSHIPS BETWEEN MANNICH BASES WITH AND WITHOUT NITROGEN LEWISITE GROUPS AND SOME COMPARABLE COMPOUNDS AS POTENTIAL IMMUNOSUPPRESSIVE AGENTS

East Berlin DIE PHARMAZIE in German Vol 31 No 5, May 76 pp 282-287 manuscript received 24 Mar 75

WERNER, W., Dr., ZSCHIESCHE, W., GUETTNER, J., and HEINECKE, H., Academy of Sciences of the German Democratic Republic, Research Center for Molecular Biology and Medicine, Central Institute for Microbiology and Experimental Therapy (Director: TAUBENECK, U., professor, Dr. of natural sciences), Experimental Therapy Section (Head: BRUNS, G., professor, MD), Jena

[Abstract] Nine nitrogen lewisite compounds, 10 C-Mannich bases ( $\beta$ -aminoketones), 13 N-Mannich bases (N-aminomethyl derivatives), 8 1,5,5-trisubstituted and 1,3,5,5-tetrasubstituted barbituric acid derivatives (not Mannich bases), 2 hydroxamic acids, 9 2,3-dihydro-1H-1,5-benzodiazepine derivatives, and 7 2,3,4,5-tetrahydro-1H-1,5-benzodiazepine derivatives were evaluated for their immunosuppressive effect. There was no general correlation between an immunosuppressive effect and a cancerostatic effect in the compounds examined. There were two which showed a significant decrease in the hemagglutinin titer, and four which lengthened the survival time of allogeneous skin transplants in mice. Two compounds caused significant inhibition of lymphocyte transport and one suppressed the humoral (but not the cellular) immunity. The hemagglutination (in terms of maximum tolerated dose) was given for each compound. Tables 7; references 30: 13 German, 2 Japanese, 1 Bulgarian, and 14 Western.

CSO: 1841

- END -